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No.

IN THE

Supreme Court of the United States

OCTOBER TERM 1983

TRANSAMERICA COMPUTER COMPANY, INC.,
Petitioner,

v.

INTERNATIONAL BUSINESS MACHINES CORPORATION,
Respondent.

APPENDIX TO PETITION FOR A WRIT OF CERTIORARI

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August 1, 1983

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APPENDIX A

IN THE

United States Court of Appeals

FOR THE NINTH CIRCUIT

TRANSAMERICA COMPUTER COMPANY, INC., a corporation,
Appellant,

v.

INTERNATIONAL BUSINESS MACHINES CORPORATION, a corporation,
Appellee.

No. 80-4048

OPINION

February 15, 1983

Before: PREGERSON and CANBY, Circuit Judges, and LUCAS,* District Judge.

PREGERSON, Circuit Judge:

Appellant Transamerica Computer Company (Transamerica), a wholly owned subsidiary of Transamerica Corporation, alleges that Appellee International Business Machines (IBM) violated Section 2 of the Sherman Act, 15 U.S.C. § 2, when it took various actions to combat emerging competition in the "plug-compatible" peripherals market. The district court held that IBM's actions did not violate the antitrust laws.

On appeal, Transamerica challenges the district court's ruling that IBM's acts did not "unreasonably restrict" competition and, in particular, challenges the court's test for predatory pricing. We affirm the district court's decision but modify its test for predatory pricing.

Background

At the heart of a computer system is the central processing unit (CPU), which houses arithmetical and logical electronic circuits. Attached to the CPU are devices called "peripherals," which perform input, output, storage, and control functions. IBM, long the dominant force in the computer industry, was, and remains, the major supplier of both CPUs and peripherals.

* The Honorable Malcolm Lucas, United States District Judge for the Central District of California, sitting by designation.

In 1967, a number of companies began offering plug-compatible peripherals—devices which could be attached to IBM's CPUs. These plug-compatible manufacturers (PCMs) enjoyed immediate market success because they offered, at substantial discounts, plug-compatible peripherals that performed as well as or better than IBM's peripherals.

Transamerica was formed to supply needed capital to PCMs. In financing transactions central to this case, Transamerica purchased millions of dollars of peripherals from two PCMs, Marshall Industries and Telex Corporation, which had previously leased these items to end users. Under this arrangement, these PCMs raised substantial capital, and Transamerica, in addition to acquiring the equipment and underlying leases, received substantial tax advantages.

IBM responded to vigorous competition from the PCMs by engaging in a number of programs which Transamerica characterizes as violations of the Sherman Act. These challenged programs included:

(1) *Leasing Program*—Prior to May 1971, IBM customers could either buy peripheral equipment or lease it on a month-to-month basis. In May 1971, IBM announced an additional method of leasing peripheral equipment—a Fixed-Term Lease Plan under which customers could lease peripheral equipment for one year at an eight percent discount below the month-to-month rate, or for two years at a sixteen percent discount.

(2) *Design Changes*—In the early 1970s, IBM redesigned the interface between the CPU and the peripherals of three tape drive systems so that PCM's peripherals would no longer be compatible with IBM's CPUs. IBM also removed an optional selector channel from two CPU models, the System 370 Models 115 and 125, so that PCM's peripherals could no longer be used with those models.

(3) *Pricing Behavior*—Also in the early 1970s, IBM introduced several "new" products—basically repackaged versions of prior peripherals—at lower prices.

Whether one characterizes IBM's actions as "meeting" competition or "precluding" competition, there is no doubt that IBM's strategy worked. Transamerica, along with fifteen out of seventeen companies involved with plug-compatible peripherals, left the market after suffering huge losses.

Because of IBM's actions in the peripherals market, Transamerica sued IBM for violations of the antitrust laws. Several other companies involved with plug-compatible peripherals also brought suits against IBM. Although initially consolidated, the actions were tried separately. Two of those actions, involving issues and facts similar to those presented here, have already been before this court. In both instances we upheld directed verdicts for IBM. *California Computer Products, Inc. v. IBM*, 623 F.2d 727 (9th Cir. 1979) (*CalComp*); *Memorex Corp. v. IBM*, 636 F.2d 1188 (9th Cir. 1980), *cert. denied*, 452 U.S. 972 (1981) (*Memorex*).

The instant case went to trial before a jury in December 1978. The trial consumed 120 days. After deliberating for ten days, the jury deadlocked and was discharged. Under a pretrial stipulation, the district judge then became the trier of fact. He ruled for IBM on all major issues. He held that (1) IBM was not a monopolist in either the general computer systems market or the peripherals market; (2) assuming, arguendo, that IBM possessed monopoly power, its leasing program, its design changes—with the exception of the design of the System 370 Models 115 and 125—and its pricing behavior did not unreasonably restrain competition; (3) IBM had not attempted to monopolize the general computer systems market or the peripherals market; and (4) assuming that Transamerica established antitrust liability, it had not proved that it suffered antitrust damages. The district court also found that IBM's redesign of the System 370 Models 115 and 125 would have unreasonably restricted competition had IBM been a monopolist, but since IBM was not a monopolist and since Transamerica suffered no damages resulting from that design change, IBM's redesign of the two CPUs did not render IBM liable for antitrust damages. *In re IBM Peripheral EDP Devices Antitrust Litigation, Transamerica Computer Co., Inc. v. IBM*, 481 F. Supp. 965 (N.D. Cal. 1979) (*Transamerica Computer*).

Standard of Review

Transamerica challenges several of the district court's findings of fact.[1] The district court's findings may not be reversed unless clearly erroneous. Fed. R. Civ. P. 52(a). Under this standard

> [a] finding is "clearly erroneous" when although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed.

United States v. *United States Gypsum Co.*, 333 U.S. 364, 395 (1948).

Monopolization and Attempt to Monopolize

Transamerica charges that IBM either monopolized or attempted to monopolize certain segments of the computer market. These separate offenses are governed by different tests. To establish monopolization, a plaintiff must prove:

> (1) possession of monopoly power in the relevant market;
>
> (2) willful acquisition or maintenance of that power; and
>
> (3) causal "antitrust" injury.

CalComp, 613 F.2d at 735.

To establish that a defendant attempted to monopolize, a plaintiff must prove:

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[1] Transamerica also challenges a number of jury instructions, arguing that

> [b]ecause this was a jury trial and because there was no waiver of the jury, this court has the same duty to review the instructions and if erroneous and prejudicial, to reverse the judgment below as it would in any other jury trial.

Transamerica Brief at 27.

Transamerica, however, freely and unconditionally stipulated before trial that the district court would decide the case if the jury was unable to reach a verdict. The stipulation was intended to avoid the expense of a retrial. 10/20/78 Tr. 8-10; 11/17/78 Tr. 18-20. By so stipulating, Transamerica agreed to a court trial if the jury deadlocked, and thus instructions given to the deadlocked jury are irrelevant to this appeal.

(1) specific intent to control prices or destroy competition with respect to a part of commerce;

(2) predatory or anticompetitive conduct directed to accomplishing the unlawful purpose;

(3) a dangerous probability of success; and

(4) causal "antitrust" injury.

Id. at 736.

There is an important relationship between the second elements of these two offenses. Conduct that does not constitute "willful acquisition or maintenance" of monopoly power (thus precluding establishment of the offense of monopolization) *cannot* constitute the "predatory or anticompetitive conduct" required to establish the offense of attempt to monopolize. *See CalComp*, 613 F.2d at 738, *quoting* 3 P. Areeda & D. Turner, *Antitrust Law* ¶ 828, at 321 (1978) ("conduct lawful for a monopolist must, *a fortiori*, be excluded as a basis for the attempt offense."). We will analyze IBM's conduct with this principle in mind. We will assume that IBM possessed monopoly power. If IBM's conduct proves lawful despite that assumption, then, *a fortiori*, IBM's conduct could not constitute an attempt to monopolize, thereby eliminating the need to consider this offense.

Leasing Practices

Transamerica alleges that IBM's Fixed Term Lease Plan (FTP) unreasonably restrained competition. Plaintiffs in both *CalComp* and *Memorex* challenged the legality of the FTP. Both times, this court upheld directed verdicts in favor of IBM on that issue. *CalComp*, 613 F.2d at 741-42; *Memorex*, 636 F.2d at 1188. The district court here also concluded that the FTP was legal. *Transamerica Computer*, 481 F. Supp. at 1001-02.

Transamerica asserts that this court's previous decisions on the FTP are not controlling because they were based on findings of fact proved erroneous in the instant trial. The district court's findings of fact, however, are indistinguishable from the findings in *CalComp* and *Memorex*. Transamerica has not demonstrated that the district court's findings in the instant case are clearly erroneous. Therefore, the holdings of *CalComp* and

Memorex control our disposition of this issue, and the district court's holding must be affirmed. *See also Greyhound Computer Corp.* v. *IBM*, 559 F.2d 488, 498-99 (9th Cir. 1977), *cert. denied*, 434 U.S. 1040 (1978).

Design Changes

IBM's design changes challenged in this case—redesign of the interface between the CPU and certain peripherals—are of the same type as those previously contested in *CalComp* and *Memorex*. Those cases upheld the legality of IBM's design changes. The district court here made a similar ruling, finding that the contested changes were improvements in the products, were not unreasonably restrictive of competition, and hence did not violate the Sherman Act.[2] *Transamerica Computer*, 481 F. Supp. at 1003-05. Transamerica has not demonstrated how the design changes in this case can be distinguished from the changes in the two other cases or how the district court's findings are clearly erroneous. Again, on the authority of *CalComp* and *Memorex*, we affirm the district court's ruling that the interface changes were not unreasonable. *See also Telex Corp.* v. *IBM*, 510 F.2d 894, 902, 906 (10th Cir. 1975), *rev'g* 367 F. Supp. 258 (N.D. Okla. 1973), *cert. dismissed*, 423 U.S. 802 (1975).

Transamerica also charges that IBM's redesign of the System 370 Model 115 and 125 CPUs unreasonably restricted competition. The 115 and 125 models were the smallest of IBM's System 370 CPUs. The models included a channel for attaching slower speed devices. The district court found that IBM redesigned the models to operate just short of the speed that would have enabled peripherals manufactured by PCMs to attach, and thus that the change unreasonably restricted competition. *Transamerica Computer*, 481 F. Supp. at 1006-08.

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[2] This court has stated that in determining whether a defendant's conduct constitutes the willful acquisition or maintenance of monopoly power required for the offense of monopolization, "the test is whether the defendant's acts, otherwise lawful, were *unreasonably* restrictive of competition." *CalComp*, 613 F.2d at 735-36 (footnote omitted) (emphasis in original). Likewise, we have said that to determine whether defendant's conduct constitutes the kind of predatory or anticompetitive action required for the offense of attempt to monopolize, "individual conduct is measured against the same 'reasonableness' standard." *Id.* at 737.

The district court, however, refused to award Transamerica damages for two reasons. First, it found that IBM did not possess monopoly power in the requisite market. Second, it found that Transamerica did not suffer any injury as a result of IBM's conduct because

> [t]he market for the tapes excluded by this conduct was insignificant. Only tape drives with data rates between 30 and 50KB were affected. Those were older, lower performance technology devices that would only have been competitive at prices far below those contemplated in Transamerica's damage claim. Transamerica probably owned some of them, but its President didn't know how many, and any Transamerica owned were purchased in the second Telex tape contract. Because that contract was not an arms-length transaction, this Court would be reluctant to award Transamerica any damages on the equipment purchased thereunder. Also, there is no evidence that Transamerica in the past supplied peripherals for the 115/125 migrator systems, or that it intended to, or took any steps to supply peripherals for the 115 and 125 systems.

Transamerica Computer, 481 F. Supp. at 1008 n.109.

We need not consider the first of these findings—that IBM lacked monopoly power—because we hold that the district court's finding that Transamerica suffered no damages attributable to the redesign of the Models 115 and 125 is not clearly erroneous. Without proving antitrust injury, Transamerica cannot recover for the antitrust violation if, in fact, any violation occurred. *CalComp*, 613 F.2d at 732. We affirm the district court's holdings on IBM's design changes.

Predatory Pricing

A. *The District Court's Findings*

In response to the challenge from the PCMs, IBM introduced several "new" products which actually were repackaged versions of existing products. The "new" products were priced below the older versions. Transamerica asserts that these lower prices were predatory.

The district court carefully examined these price cuts. *Transamerica Computer*, 481 F. Supp. at 996-1002. It concluded that IBM expected the new products to "return substantial profits," *id.* at 997; that, in fact, the products were profitable; and that the prices at issue exceeded the average total cost of producing the products. *Id.* at 1002. After an extensive analysis, the court concluded that IBM's pricing policy was legal.

The district court's finding that the challenged prices exceeded IBM's average cost is not clearly erroneous.[3] The district court, however, applied an incorrect test in deciding whether such prices were predatory. We set out the correct test below, apply that test to this case, and conclude that IBM's pricing policy was legal.

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[3] At trial, IBM presented evidence that the prices challenged by Transamerica were above average total cost. Transamerica contended that IBM's prices, after application of several accounting adjustments, were below average total cost. The district court held that the adjustments were inappropriate. *Transmerica Computer*, 481 F. Supp. at 998-1001. Transamerica does not appeal this ruling.

Transamerica also asked the district court to include "impact costs" in calculating IBM's profits. Impact costs are the "reduction in anticipated future profits on an existing product line caused by the introduction of a new product line." *In re IBM Peripheral EDP Devices Litigation, Transamerica Computer Co., Inc. v. IBM*, 459 F. Supp. 626, 631 (N.D. Cal. 1978). The district court ruled before trial that impact costs should not be included in calculating total costs because to do so would create a disincentive to research and innovation and because impact costs are difficult to calculate. *Id.* Despite this pre-trial ruling, Transamerica was allowed to introduce evidence of impact costs. Transamerica Brief at 21, 50; 72 Tr. 12445-519, 73 Tr. 12541-47, 12568-97, 12614-19, 12645-50, 12666-87. Transamerica does not contend on appeal that it was precluded from introducing any evidence on impact costs.

Although evidence of impact costs was before the district court, it did not discuss such costs in reaching its findings of fact on Transamerica's predatory pricing claim. On appeal, Transamerica contends the district court committed prejudicial error in foreclosing consideration of impact costs.

Our review of the record indicates that these costs were speculative. IBM's old products were also being displaced by products produced by PCMs. While IBM might have "lost" profits through the introduction of new products, it arguably would have lost more without the new products. The profits that Transamerica claims IBM could have reaped from its old products might never have been realized by IBM because of competition from the PCMs. In these circumstances, we cannot say that the district court was clearly erroneous in not including impact costs in its calculations. *But see* Ordover and Willig, *An Economic Definition of Predation: Pricing and Product Innovation*, 91 Yale L.J. 8, 26 n.49 (1981). We do not foreclose the possibility that impact costs ought to be considered when appropriate.

B. *The Economic and Legal Background*

We differ with the district court on the proper analysis of situations where a defendant's prices are alleged to be predatory even though they exceed the defendant's average total cost. To analyze such situations, a preliminary discussion of economic terminology and legal precedents is helpful.

Predatory pricing occurs when a company that controls a substantial market share lowers its prices to drive out competition so that it can charge monopoly prices, and reap monopoly profits, at a later time. *William Inglis & Sons Baking Co. v. ITT Continental Baking Co., Inc.*, 668 F.2d 1014, 1031-32 (9th Cir. 1981), *cert. denied*, 103 S. Ct. 58 (1982); *Janich Bros., Inc. v. American Distilling Co.*, 570 F.2d 848, 856 (9th Cir. 1977), *cert. denied*, 439 U.S. 829 (1978); L. Sullivan, *Handbook of the Law of Antitrust* 109 (1977). It can be difficult, however, to distinguish predatory price cuts intended to eliminate competition from legitimate price cuts designed to meet or beat competition. An influential attempt to clarify the distinction was made by Professors Phillip Areeda and Donald Turner, who proposed a "cost-based" test for predation.[4] Under such a test, the relation between the cost of producing a product and the price charged for it is the criterion for determining whether the price is predatory.

Economists, however, measure a firm's costs in a number of ways, and these measures are relevant in understanding the Areeda-Turner proposal and this court's reaction to it. Costs are divided into *fixed costs* (those that do not vary with changes in output) and *variable costs* (which do so vary). *Total cost* is the sum of fixed and variable costs. *Marginal cost* is the increment to total cost that results from producing an additional unit of output. *Average cost*, or *average total cost*, is obtained by dividing total cost by output. Likewise, *average variable cost* is the sum of all variable costs divided by output. Average cost is thus higher than average variable cost for all output levels.[5]

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[4] Areeda Turner, *Predatory Pricing and Related Practices Under Section 2 of the Sherman Act*, 88 Harv. L. Rev. 697 (1975).

[5] *See* 3 P. Areeda & D. Turner, *Antitrust Law* ¶ 712 for a full discussion of these terms.

Areeda and Turner suggest that prices be considered *per se* lawful (*i.e.*, non-predatory) if they exceed the defendant's marginal cost or average variable cost,[6] and that prices be considered *per se* illegal (predatory) if they are below marginal or average variable cost.[7] The rationale for this cost-based *per se* test is the belief that a company that makes a profit, however small, on each additional product does so because it is efficient, and should not face antitrust challenges, whereas a company that loses money on the sale of an additional product is doing so presumably for anti-competitive reasons.

The Areeda-Turner test has provoked much judicial and academic comment.[8] This court has been influenced by the Areeda-Turner test without unqualifiedly embracing it. In a series of opinions during the three years preceding the district

[6] Areeda and Turner favor using marginal cost as "the economically sound division between acceptable, competitive behavior and 'below-cost' predation." Areeda & Turner, *supra* note 4, at 716. They recognized, however, that marginal cost is usually difficult or impossible to compute and suggested using average variable cost—which is likely to approximate marginal cost—as a surrogate. *Id.* at 716-18.

[7] Areeda and Turner make an exception where marginal cost exceeds average total cost. In this rare case, the price "floor" for permissible pricing is average total cost. Areeda & Turner, *supra* note 4, at 713.

[8] While no courts have explicitly adopted the Areeda-Turner test in its entirety for all cases, a number of courts have adopted elements of the Areeda-Turner test. *See, e.g., Northeastern Tel. Co.* v. *American Tel. & Tel. Co.*, 651 F.2d 76, 87-88 (2d Cir. 1981), *cert. denied*, 455 U.S. 973 (1982); *Chillicothe Sand & Gravel Co.* v. *Martin Marietta Corp.*, 615 F.2d 427, 431-32 (7th Cir. 1980); *Pacific Eng'g & Prod. Co.* v. *Kerr-McGee Corp.*, 551 F.2d 790, 797 (10th Cir.), *cert. denied*, 434 U.S. 879 (1977); *National Ass'n of Regulatory Util. Comm'rs* v. *FCC*, 525 F.2d 630, 637-38 & n.34 (D.C. Cir.), *cert. denied*, 425 U.S. 992 (1976); *International Air Indus. Inc.* v. *American Excelsior Co.*, 517 F.2d 714, 723-25 (5th Cir. 1975), *cert. denied*, 424 U.S. 943 (1976).

The Areeda-Turner test also generated a number of counter proposals for evaluating predatory pricing. Sullivan, for example, suggests that courts look to "human animus" in market conduct. He would focus on the "traces" a predator leaves behind, such as documents containing information about competitors. Sullivan, *Economics and More Humanistic Disciplines: What are the Sources of Wisdom for Antitrust?*, 127 U. Pa. L. Rev. 1214, 1229-30, 1232 (1977).

Joskow and Klevorick suggest a complex cost-based test in which market structure is considered and the defendants have a greater burden to produce documentation of their costs. Joskow & Klevorick, *A Framework for Analyzing Predatory Pricing Policy*, 89 Yale L.J. 213 (1979).

(*Footnote continued on following page*)

court's decision reviewed here,[9] we approved the use of marginal or average variable cost in establishing predation without making that mode of proof exclusive, as Areeda and Turner advocate. Indeed, we adopted neither the Areeda-Turner test's conclusive presumption that prices above marginal or average variable cost are legal, nor its conclusive presumption that prices below that cut-off point are predatory. It is true that in *Hanson* v. *Shell Oil Co.*, 541 F.2d 1352, 1359 n.6 (9th Cir. 1976), *cert. denied*, 429 U.S. 1074 (1977), we spoke of "proof of pricing below marginal or average variable cost" as a "prerequisite to the prima facie showing of an attempt to monopolize." Nevertheless, we suggested that prices above marginal or average variable cost might, in appropriate circumstances, be found predatory, *id.* at 1358 n.5, and we reiterated that point in *CalComp*, 613 F.2d at 743. We also explicitly denied that prices below marginal or average variable cost were *per se* unlawful. *Hanson*, 541 F.2d at 1359 n.6. In short, the closest we were willing to move to the Areeda-Turner approach was to acknowledge that a "price set at or above marginal cost should not *ordinarily* form the basis for an antitrust violation." *Janich Bros., Inc.* v. *American Distilling Co.*, 570 F.2d at 857 (footnote omitted) (emphasis added).

Any doubt that this circuit rejects the *per se* aspects of the Areeda-Turner test was dispelled in *William Inglis & Sons Baking Co.* v. *ITT Continental Baking Co., Inc.*, 668 F.2d 1014

(Footnote continued from preceding page)

Williamson considers output a more important factor than cost or price. He would prohibit a monopolist confronted with a new competitor from increasing its output for twelve to eighteen months. This restraint would diminish as the entrant gained experience and economies of scale. Williamson, *Predatory Pricing*, 87 Yale L.J. 284 (1977).

For the most recent discussion of these ideas and the Areeda-Turner test see Note, *Predatory Pricing: The Retreat From the AVC Rule and the Search for a Practical Alternative*, 22 B.C.L. Rev. 467 (1981).

See also Ordover and Willig, *An Economic Definition of Predation: Pricing and Product Innovation*, 91 Yale L.J. 8 (1981); Baumol, *Quasi-Permanence of Price Reductions: A Policy for Prevention of Predatory Pricing*, 89 Yale L.J. 1 (1979); Williamson, *Predatory Pricing: A Strategic and Welfare Analysis*, 87 Yale L.J. 284 (1977).

[9] *California Computer Products, Inc.* v. *IBM*, 613 F.2d 727 (9th Cir. 1979); *Janich Bros., Inc.* v. *American Distilling Co.*, 570 F.2d 848 (9th Cir. 1977), *cert. denied*, 439 U.S. 829 (1978); *Hanson* v. *Shell Oil Co.*, 541 F.2d 1352 (9th Cir. 1976), *cert. denied*, 429 U.S. 1074 (1977).

(9th Cir. 1981), *cert. denied*, 103 S. Ct. 58 (1982), decided after the district court's decision in the instant case. In *Inglis* we explained that prices are predatory when their justification rests, "not on their effectiveness in minimizing losses, but on their tendency to eliminate rivals and create a market structure enabling the seller to recoup his losses." *Id.* at 1035.[10] We emphasized that this standard, "and not rigid adherence to a particular cost-based rule . . . must govern our analysis of alleged predatory pricing." *Id.* Yet *Inglis* did not, as Transamerica contends here, repudiate all cost-based tests. Rather, it laid down a cost-based test for allocating the burden of proof on the predation issue in place of one designed (like the Areeda-Turner test) to resolve that issue conclusively:

> [T]o establish predatory pricing a plaintiff must prove that the anticipated benefits of defendant's price depended on its tendency to discipline or eliminate competition and thereby enhance the firm's long-term ability to reap the benefits of monopoly power. If the defendant's prices were below average total cost but above average variable cost, the plaintiff bears the burden of showing defendant's pricing was predatory. If, however, the plaintiff proves that the defendant's prices were below average variable cost, the plaintiff has established a prima facie case of predatory pricing and the burden shifts to the defendant to prove that the prices were justified without regard to any anticipated destructive effect they might have on competitors.

Id. at 1035-36.

C. *The Treatment of Prices Above Average Total Cost*

The *Inglis* test, quoted above, addresses only two categories of prices—those below average variable cost (which, under burden shifting, the defendant must prove are non-predatory)[11] and those above average variable cost but below average total cost (which the plaintiff has the burden of proving are predatory). The *Inglis* test says nothing about how to evaluate prices for antitrust purposes that exceed average total cost. Indeed, *Inglis* explicitly left this question open. 668 F.2d at 1035 n.30.

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[10] *See also D & S Redi-Mix v. Sierra Redi-Mix & Contracting Co.*, 692 F.2d 1245, 1249 (9th Cir. 1982).

[11] Of course, plaintiff initially bears the burden of proving that defendant's price did in fact fall into this category of suspect prices.

In the instant case, the district court, which did not have the benefit of *Inglis* and its clarification of our previous discussions of the Areeda-Turner test, held that prices above average total cost "should be conclusively presumed legal." *Transamerica Computer*, 481 F.Supp. at 991.[12] We disagree for several reasons.

First, this court has already recognized that prices exceeding average total cost might nevertheless be predatory in some circumstances. The specific example we discussed was "limit pricing," in which a monopolist sets prices above average total cost but below the short-term profit-maximizing level so as to discourage new entrants and thereby maximize profits over the long run. *See* 3 P. Areeda & D. Turner, *supra*, ¶ 714b. We explained that "limit pricing by a monopolist might, on a record which presented the issue, be held an impermissible predatory practice." *CalComp*, 613 F.2d at 743. A similar pricing strategy would be for a monopolist to make *temporary* reductions to a level above average total cost but below the profit-maximizing price whenever a new entrant appears ready to enter the market. One or two such reductions could discourage potential entrants in a market that requires sizable initial investments, leaving the monopolist free to raise his prices to monopoly levels. *See* 3 P. Areeda & D. Turner, *supra*, ¶ 714c. Such a pricing strategy, like limit pricing, could well be found predatory.[13]

Second, the district court's *per se* test rests on the notion that price reductions to average total cost result from efficient production and harm only less efficient competitors. *Transamerica Computer*, 481 F. Supp. at 991. But companies may lower their prices for temporary strategic reasons as well. One

[12] To this extent the district court was, as it noted, agreeing with Areeda and Turner. *Transamerica Computer*, 481 F. Supp. at 991. It disagreed with them, however, by concluding that prices below average total cost are not *per se* lawful even if they exceed average variable cost. *Id.* at 991-95. The treatment of prices between average total cost and average variable cost has since been settled in this circuit by *Inglis* and is not at issue here.

[13] We do not mean to suggest that all pricing that is not profit maximizing in the short run is illegal. As we stated in *Inglis*, prices below the level at which profit is maximized "may legitimately be justified on long-term considerations, as long as those do not include the anticipation of enhanced market power as a result of predation." *Inglis*, 668 F.2d at 1034 n.29.

critic of the Areeda-Turner test points out that a monopolist can employ price strategies that jeopardize consumers' long-run welfare without lowering prices below average total cost and concludes that "it is unrealistic and even analytically wrong to apply a simple short-run price-cost rule for determining whether exclusionary pricing by a monopolist is socially undesirable and therefore predatory." Scherer, *Predatory Pricing and the Sherman Act: A Comment*, 89 Harv. L. Rev. 869, 890 (1976). It may be difficult in many or most instances to assess the long-run consequences of challenged pricing policies.[14] But where those difficulties can be overcome, the law should not prevent plaintiffs from proving antitrust violations.

Third, the uncertainty and imprecision inherent in determining "costs" counsel against basing conclusive presumptions on the relation between prices and costs. Assessing those relations for the products of a multi-product firm requires allocating known and estimated costs and revenues among various products. While accounting problems do not warrant ignoring cost figures completely, they do make it unwise to rely *exclusively* on such figures.

Finally, we should hesitate to create a "free zone" in which monopolists can exploit their power without fear of scrutiny by the law. A rule based exclusively on cost forecloses consideration of other important factors, such as intent, market power, market structure, and long-run behavior in evaluating the predatory impact of a pricing decision.[15]

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[14] *Cf.* Areeda & Turner, *Scherer on Predatory Pricing: A Reply*, 89 Harv. L. Rev. 891, 897 (1976); 3 P. Areeda & D. Turner, *supra* note 5, ¶ 715, at 166-67.

[15] The Seventh Circuit also recognizes the importance of considering non-price factors in evaluating whether a pricing policy is predatory. *Chillicothe Sand & Gravel Co.* v. *Martin Marietta Corp.*, 615 F.2d 427, 432 (7th Cir. 1980); *see also MCI Communications Corp.* v. *American Tel. & Tel. Co.*, —F.2d—at— n.58, Nos. 80-2171, 80-2288 (7th Cir. Jan. 12, 1983). *Cf. Pacific Eng'g & Prod. Co.* v. *Kerr-McGee Corp.*, 551 F.2d 790, 797 (10th Cir.), *cert. denied*, 434 U.S. 879 (1977).

This is also the position of the National Commission for the Review of Antitrust Laws and Procedures. Report to the President and the Attorney General (Jan. 22, 1979). As the Deputy Attorney General for the Antitrust Division noted, cost-based tests do not "truly reflect marketplace realities and provide for anticompetitive behavior." He also noted that even Areeda and Turner "are now troubled by excluding factors like direct evidence of intent."

(Footnote continued on following page)

For these reasons, we disagree with the district court's conclusion that prices above average total cost should be legal *per se*. Rather, we believe that *Inglis* adopted the proper approach to the use of cost figures in determining whether prices are predatory: cost categories should be used to allocate the burden of proof on the issue of predation. By this approach, we give due weight to the economic considerations which suggest that prices are presumptively lawful if they exceed marginal or average variable cost and presumptively predatory if they do not. And, of course, this approach does not preclude a litigant from introducing evidence sufficient to overcome these presumptions. *Inglis* followed this approach in evaluating prices below average variable cost and prices between average variable cost and average total cost. The logic of the *Inglis* approach applies with equal force in evaluating prices above average total cost.

The test for determining the antitrust legality of prices that exceed average total cost should be consistent with the *Inglis* approach and with our view that cost-price relations should not be the exclusive method of proving predation. In addition, the test should be consistent with the economic analysis of Areeda and Turner. Their analysis indicates that prices above average total cost will rarely be predatory.[16] Therefore, it is appropriate to impose on the plaintiff a greater burden of proving that prices above average total cost are predatory than the burden imposed by *Inglis* to prove that prices between average variable and average total cost are predatory. We therefore hold that if the challenged prices exceed average total cost, the plaintiff must prove by clear and convincing evidence—*i.e.*, that it is highly probably true—that the defendant's pricing policy was predatory.

(Footnote continued from preceding page)

Remarks of Ky P. Ewing, Jr., Deputy Assistant Attorney General, Antitrust Division, before the Fifth Annual Symposium on Antitrust Law, The Southwestern Legal Foundation, Dallas, Texas, on May 9, 1980, [1980] Trade Reg. Rep. (CCH) ¶ 55,936. The report recommends that the Sherman Act should be amended to provide that, although marginal cost should be considered in determining whether prices are predatory, a showing of pricing below marginal cost should not be a prerequisite to make out an attempt to monopolize based on pricing practices. Report to the President at 40.

[16] Predatory pricing should not be countenanced merely because it would be difficult to detect in situations where price exceeds average total cost. *See Chillicothe Sand & Gravel Co.* v. *Martin Marietta Corp.*, 615 F.2d 427, 432 (9th Cir. 1980) ("Section 2 of the Sherman Act makes no exceptions for cases involving administrative difficulty.").

D. *The Proper Test Applied to This Case*

While we modify the test applied by the district court, we affirm the court's decision that IBM's pricing policy did not violate the antitrust laws.[17]

The district court found that IBM's prices were above its average total cost. *Transamerica Computer*, 481 F. Supp. at 1002. This finding was not clearly erroneous. Thus, to prevail on its claim of predatory pricing, Transamerica must prove by clear and convincing evidence that IBM's pricing policy unreasonably restricted competition. The exhaustive trial record, containing a plethora of evidence on pricing behavior, market structure, production costs, marketing strategies, and other related information, fails to provide any clear and convincing evidence of predatory pricing.[18] Transamerica did not, for example, introduce evidence that IBM's prices rose once competition had left the market. The only price increases cited by Transamerica were modest increases in the mid-1970s. During that inflationary period, however, IBM increased prices on all its products, not just those involved in this case. Transamerica did not prove that IBM engaged in limit pricing.[19] Transamerica simply introduced evidence of an initial price cut,

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[17] "We may uphold correct conclusions of law even though they are reached for the wrong reason or for no reason, and we may affirm a correct decision on any basis supported by the record." *United States* v. *Washington*, 641 F.2d 1368, 1371 (9th Cir. 1981), *cert. denied sub nom. Duwamish Indian Tribe* v. *Washington*, 454 U.S. 1143 (1982).

[18] At trial Transamerica was not precluded from introducing evidence of predatory pricing. The district court's ruling that prices above average total cost are *per se* legal was made after the trial concluded.

[19] While Transamerica contends that it proved that IBM engaged in limit pricing, the evidence suggests otherwise. Limit pricing exists where entry barriers are "great enough to prevent other entry," *Hanson*, 541 F.2d at 1358 n.5, or are "extremely high," *Pierce Packing Co.* v. *John Morrell & Co.*, 633 F.2d 1362, 1366 (9th Cir. 1980). Here, the district court found that the entry barriers to the peripherals market were "extraordinarily low." *Transamerica Computer*, 481 F. Supp. at 987.

Further, a limit price is designed to deter entry into the market. To be limiting, therefore, the price must generally be below competitors' prices. Here, "IBM's prices did not undercut the PCM's prices, they did not even equal them, they merely closed the gap; the PCM's prices were still lower." *Id.* at 1002.

The evidence also suggests that IBM's prices did not have a limiting effect. A number of companies entered the peripherals market and took substantial business from IBM. *Id.* at 986. The early success of the PCMs suggests that no limit pricing occurred.

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hardly an unusual act in the computer industry or unusual in the face of competition. Transamerica's evidence of predatory pricing falls far short of the type of clear and convincing evidence that would permit the trier of fact to find predatory pricing when prices were above average total cost.

Conclusion

Thus, even assuming that IBM possessed monopoly power in the relevant market, its lease plan, design changes, and pricing policy did not constitute unreasonable restrictions on competition. On this record, IBM was entitled to judgment as a matter of law. Therefore, we need not consider whether the district court erred in finding that IBM did not possess monopoly power, *Transamerica Computer*, 481 F. Supp. at 974-87, or that Transamerica had failed to prove damages. *Id.* at 1010-21.

The judgment is AFFIRMED.

LUCAS, District Judge, concurring:

I agree that the judgment of the district court in favor of defendant should be affirmed. I disagree, however, with the court's modification of the trial court's test for predatory pricing.

Professors Areeda and Turner, in their article, *Predatory Pricing and Related Practices Under Section 2 of the Sherman Act*, 88 Harv. L. Rev. 697 (1975), proposed an exhaustive *per se* rule for determining whether pricing conduct should be deemed predatory: (1) prices above reasonably anticipated average variable cost should be conclusively presumed lawful; and (2) prices below reasonably anticipated average variable

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Finally, while *CalComp* held that "limit pricing by a monopolist might, on a record which presented the issue, be held an impermissible predatory practice," 613 F.2d at 743, *CalComp* found that IBM's prices did not constitute limit pricing but rather were a lawful response to competition. *Id.* Transamerica's evidence is indistinguishable from CalComp's. As in *CalComp*, we find that the evidence does not indicate that IBM engaged in limit pricing.

cost should be conclusively presumed unlawful.[1] In the nearly seven years since this article appeared many courts have considered this suggestion. *See* Spivak, *Monopolization Under Sherman Act, Section 2*, 50 Antitrust Law Journal 285, 313-14 n.132 (1982). Although it appears that no court has adopted this proposed rule without modification or qualification, many courts have agreed with Areeda and Turner that the relationship between prices and average variable cost is of significance in evaluating pricing behavior under the Sherman Act. *Id.* This court, in *William Inglis & Sons Co.* v. *ITT Continental Baking Co., Inc.*, 668 F.2d 1014 (9th Cir. 1981), *cert. denied*, 103 S. Ct. 58 (1982), made clear that the relationship was to be used to allocate the burden of proof on the issue of predation, rather than to resolve the issue conclusively. In thus modifying Areeda and Turner's suggested rule, the court explicitly declined to address their more modest yet important suggestion that prices above average *total* cost should be conclusively presumed legal.[2] Judge Schnacke found this limited rule to be sound and used it in granting judgment in favor of defendant. In my opinion, the trial court was correct.

In rejecting the approach taken by Judge Schnacke, the court expresses four concerns. First the court points out that under certain circumstances price reductions might properly be labeled "predatory" even though prices never fall to average total cost or below. Two examples are given, both of which have often been discussed by the academics and by the courts: limit pricing and temporary price reductions in an industry with

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[1] Noting "marginal cost data are typically unavailable," Professors Areeda and Turner use average variable cost as a surrogate for marginal cost. Areeda & Turner, *Predatory Pricing and Related Practices Under Section 2 of the Sherman Act*, 88 Harv. L. Rev. 697, 717 (1975).

[2] Inglis, *supra*, 668 F.2d 1014, 1035 n.30. Average total cost is, by definition, always higher than average variable cost. *See* Areeda & Turner, *supra* note 1, at 700-01. A *per se* rule tied to average total cost creates, therefore, a smaller area in which pricing conduct will be presumed to be legal than a rule tied to average variable cost. (It is true that average variable cost is used as a surrogate for marginal cost and that marginal cost can, in some unusual cases, exceed average total cost. *Id.* Areeda and Turner modify their marginal cost rule in these cases, however, to provide that prices below marginal cost are legal if they exceed average total cost. *Id.* at 712-13.)

high entry barriers. *See, e.g.*, Areeda & Turner, *supra*, at 705-09; *In re IBM Peripheral EDP Devices Antitrust Litigation*, *Transamerica Computer Co., Inc.* v. *IBM*, 481 F. Supp. 965 (N.D. Cal. 1979) [*Transamerica Computer*]; Scherer, *Predatory Pricing and the Sherman Act: A Comment*, 89 Harv. L. Rev. 869 (1976). The second concern voiced by the court is that the district court erred in assuming that all "price reductions to average total cost result from efficient production and harm only 'less efficient competitors.'" *Ante*, at 13. This, however, merely restates the first concern noted by the court, for the only price reductions not attributable to efficient production which should be labeled "predatory" are those which harm equally or more efficient competitors. These fall into the two categories noted in the above examples. Indeed, the court's final argument, that "we should hesitate to create a 'free zone' in which monopolists can exploit their power without fear of scrutiny by the law," expresses the same fear voiced in the first two arguments.

The fear that some pricing conduct in the realm above average total cost might have socially undesirable effects in the long run does not, however, necessarily provide an adequate justification for adopting the rule approved by the court. One must also evaluate the practical utility of the rule, the consequences of adopting such a rule, and the advantages which a contrary rule, in this case a *per se* rule, might provide.

The court concedes that pricing conduct above average total cost will only "rarely" have socially undesirable effects and, thus, constitute predation. *Ante*, at 15.[3] Thus, even absent any practical problems of proof, the court's rule will seldom yield a result different from that which a *per se* rule would yield. The court also recognizes, however, that there will be problems

[3] Even Spivak, who disagrees vigorously with the price tests put forward by Areeda and Turner, concedes that where prices are above average total cost, courts could "almost invariably" decide the predatory pricing issue on cost data alone. *See* Spivak, *Monopolization Under Sherman Act Section 2*, 50 Antitrust L.J. 285, 315-16 (1982).

of proof in this area. *Ante*, at 14 n.14. It will be extremely difficult if not impossible to prove up facts sufficient to support a finding of predation where prices do not drop below average total cost. *See Transamerica Computer, supra*, 481 F. Supp. at 991. These practical difficulties, combined with the higher burden of proof imposed by the court today, raise a serious question as to whether liability will in fact be imposed in those rare cases in which it might be.

Yet while the court's rule is likely to have little practical utility, it could well inhibit socially desirable conduct. As Judge Schnacke noted below:

> It would be all but impossible to distinguish between above cost limit pricing conduct and a monopolist's procompetitive reaction to lower priced competitors. One external characteristic is common to both cases, a lowered price. An attempt to attach liability to the one will surely inhibit the indistinguishable other.

Transamerica Computer, supra, at 991 (footnotes omitted). Furthermore, the rule approved by the court may well increase the number of meritless antitrust actions filed: without a reasonable "safe harbor" in which to seek shelter, every monopolist engaged in legal price competition above average total cost will be a potential target for attack by a competitor attempting to prove that its case is one of the rare instances of predatory pricing conduct.

In addition to these shortcomings, it cannot be doubted that the court's rule will increase the difficulty of trying complex antitrust cases. *Cf. Inglis, supra*, at 1063-64 (Judge Wallace dissenting from denial to rehear *en banc* voiced similar concerns with the court's rejection of the marginal cost rule). A *per se* rule, by contrast, would provide a manageable way of significantly simplifying some aspects of many cases.

In addition to the court's fear of monopolist exploitation of the "free zone" above average total cost, the court gives an additional ground for rejecting a *per se* rule: the difficulty of calculating costs. Because such costs are difficult to calculate, the court finds it unwise to base conclusive presumptions on the

price-cost relationship. Though difficult, the task of calculating costs is not impossible. As with other difficult factual issues, the finder of fact, aided by expert testimony, will, I believe, be able to determine average total cost with reasonable precision. Thus, I cannot agree that the difficulty of calculating costs warrants rejection of a useful and sound decisional tool such as the *per se* test tied to average total cost.

On balance, I find the limited *per se* rule adopted by Judge Schnacke to be preferable to the test approved by the court today. I would affirm the judgment without modifying the trial court's test for predatory pricing.

APPENDIX B

IN THE

United States District Court

FOR THE NORTHERN DISTRICT OF CALIFORNIA

In re IBM Peripheral EDP Devices
Antitrust Litigation
MDL No. 163-RM

TRANSAMERICA COMPUTER COMPANY, INC., a corporation,
Plaintiff,
v.
INTERNATIONAL BUSINESS MACHINES CORPORATION, a corporation,
Defendant.

C-73-1832 RHS
OPINION
October 18, 1979
AS AMENDED
December 20, 1979

The opinion heretofore filed is revised and amended to read as follows:

I.

Plaintiff, Transamerica Computer Company, Inc. ("Transamerica"), has alleged that certain activities of Defendant, International Business Machines Corporation ("IBM"), violated Section 2 of the Sherman Act which forbids the monopolization or attempted monopolization of any part of trade or commerce.[1]

An appreciation of the nature of the computer industry and the parties' respective roles is helpful to an understanding of, and indispensable to an evaluation of, that conduct.

Computers, like the punched card accounting equipment that preceded them, depend upon the capabilities of the electronic circuits. Because of the laws of physics involved, an electronic circuit, if properly designed, is capable of performing

[1] 15 U.S.C. Section 2.

both arithmetic and logical functions. For instance, it is possible to design a circuit that will add two numbers together (an arithmetic function), and another circuit that will compare the result of the addition to a third number and choose between various alternatives on the basis of that comparison (a logical function). The sequence of arithmetic and logical functions that are to be performed is known as a program. With punched card accounting equipment, programs were "hard-wired," that is, the sequence of functions to be performed by the arithmetic and logical circuits was predetermined, and could only be altered by actually switching wires around within the machine.

In 1951, in response to the needs of the Bureau of the Census, Sperry Rand Corporation introduced the first stored-program computer, the Univac 1. The first computer differed from its predecessors in that it was possible easily to alter the program that determined the sequence of functions to be performed. No longer was it necessary to "hard-wire" the program; the sequence of functions desired could now be indicated to the computer through "softer" and more flexible means. A program could be punched into a series of cards and the content of those cards could then be read into the computer. The computer would turn to this data read in from the cards for instructions as to what arithmetic and logical functions it was to perform, and in what sequence. A program could be altered simply by altering a punched card, and new programs could be carried out merely by causing the machine to read in a different set of punched cards.

IBM offered its first electronic computer in 1953. That machine, like those offered by competitors, utilized vacuum tubes to perform the electronic circuit functions. Before long, this first generation of computers was outmoded by a second-generation whose transistorized circuits performed more economically and more reliably. In 1964, IBM announced a series of machines, the System/360; these were the first of the third generation computers. The 360s not only employed improved components (integrated circuits replaced transistors), they also relied upon a single general design or architecture for a broad spectrum of machines. That meant that one computer was

capable of efficiently performing both scientific and commercial tasks, and, perhaps most important, it meant that customers who outgrew their smaller machines could "migrate" to larger machines without the need to change their existing programs; the whole 360 family of computers was program-compatible to an unprecedented degree. As a result, System/360 was a tremendous commercial success.

In 1970 IBM announced its 370 system, a further significant improvement, and superior to the 360 system.

The new 370 system involved improved central processing units as well as new and improved peripherals. All of the acts Transamerica claims caused it damage were related to the introduction of the 370 system.

IBM is a supplier of computer systems, supplying all, or nearly all of the user's computing needs. It offers a wide range of services and products, both software and hardware.[2]

The hardware of a computing system consists of a central processing unit ("CPU"), which houses the arithmetic and logical electronic circuits, and a variety of peripheral gear.

The functions of peripherals include: storing data for later access by the CPU; feeding data into the CPU (input); and accepting data from the CPU (output). A machine capable of reading data on punched cards and transferring that data to the CPU is considered an input peripheral, while a printer attached to the CPU functions as an output peripheral. Some peripherals perform all three functions. Disk drives and tape drives are examples of peripherals capable of storing data, inputting data, and outputting data. Data is stored on disks and is "randomly" accessed very rapidly by an access arm with the capability of reading or writing data. The access arm can be made to move to a particular track on the disk where the data is to be read or written. Tape drives are used for reading and writing data sequentially. Random access of data on tape reels is impractical because it is so time consuming.

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[2] Programs have come to be known as "software" while the term "hardware" has been reserved to refer to the physical machinery associated with the computer.

The tape and disk drives which attached to System/360 CPUs were a lucrative part of IBM's business, so lucrative in fact, that they attracted competition. In the late 1960's, several companies began marketing copies of IBM's tapes, disks and printers, which were "plug-compatible" with IBM CPUs. A user could simply unplug the IBM peripheral, substitute the cheaper copy, and plug it into the IBM CPU. The companies providing this new competition became known in the industry as plug-compatible manufacturers ("PCMs").

The PCMs enjoyed a tremendous success. They were offering equivalent or better performance at a substantial discount. But in order to sustain their growth the PCMs needed funds. Most computer systems were leased rather than sold. This meant that the PCMs were unable to realize a quick return on their capital investment; much of their capital was tied up in ownership of leased machines, an investment that would not be recouped for years. The PCMs needed money to finance the manufacture of machines to meet a growing demand as well as to pay for the engineering costs of developing new products. They sought financing from a variety of sources: the sale of equity and debt securities; bank loans; the use of leasing companies; and more complex arrangements.

Transamerica Computer Company, Inc., was incorporated in late 1967 as a wholly-owned subsidiary of Transamerica Corporation, a large non-bank financial conglomerate with wholly-owned subsidiaries in the insurance, auto rental, motion picture and other businesses. The parent was well financed, with nearly unlimited credit, and desired a "window to the computer industry." Transamerica made a number of ventures into computer related financing. The transactions central to this case are Transamerica's purchase of millions of dollars worth of on-lease tapes and disks from two PCMs, Marshall Industries ("Marshall") and Telex Corporation ("Telex").

These manufacturers leased their equipment to end users. After it was on lease, the equipment was "sold" to Transamerica under an arrangement by which the manufacturers were obligated to collect the rents, to service and maintain the equipment, and to remarket it as leases expired. Unlike some

leasing companies which buy equipment, find users, collect rentals, etc., Transamerica had no function except to supply capital. In many cases the end users were unaware of Transamerica's ownership of their equipment, and, indeed, at various times there was considerable doubt as to whether specific equipment was owned by Transamerica or the manufacturer. The arrangements also contemplated that, after Transamerica had been reimbursed some agreed amount, further rental revenues would be shared between it and the manufacturer. There were two important reasons for this structuring of what was basically a financing arrangement. First, Transamerica expected that, as "owner" of the equipment, it would be permitted to take, for the substantial benefit of its parent, the investment tax credit then available under the tax laws. And, second, the manufacturers hoped to treat the transfers of title to Transamerica as sales, thus increasing their current profit picture, and aiding them in sales of their corporate stock. Neither of these benefits would have resulted if Transamerica had simply lent money to the manufacturer.

Telex and Marshall were but two of the companies which were successful in displacing IBM peripheral equipment by offering it at prices well below those IBM was charging. IBM responded to the PCM competition by offering certain of its own products at substantially reduced prices, and by offering its peripherals for lease on longer and better terms than it had previously. In addition, new CPUs were introduced that were incompatible with the PCMs' existing peripherals. These actions, and others described herein, are those that Transamerica contends were the means by which IBM monopolized and attempted to monopolize in violation of Section 2.

Following a seven month trial, a jury was unable to reach a unanimous verdict on any of the issues presented. The parties, before commencement of the trial, foresaw that possibility, and, stipulated that the case would be submitted to the Court for decision in the event of jury disagreement. (It might be well for the courts or Congress to consider whether such an arrangement might be *compelled* by the trial judge in advance of trial. No one case should be allowed to monopolize the court's time

indefinitely to the exclusion of the rights of other litigants. If, after one long jury trial, it becomes apparent that further jury trials would be inordinately time consuming, without realistic expectation that the issues would be resolved, the matter should be resolved otherwise. The best method would seem to be by decision of the trial judge on the evidence presented at the jury trial.)

This Court, having heard and fully reviewed all of the evidence, has made the findings of fact and come to the conclusions of law that are incorporated in this opinion.

II.

In order to establish that IBM monopolized in violation of Section 2 of the Sherman Act,[3] plaintiff must prove:

(1) that the defendant was in possession of monopoly power in a relevant market; and either

(2) that the defendant has willfully acquired or maintained that power;[4] or

(3) that the defendant used its monopoly power, whether lawfully or unlawfully acquired, to foreclose competition, to gain a competitive advantage, or to destroy a competitor.[5]

The first essential inquiry must be whether IBM possessed monopoly power; whether it had the power to control prices in, or to exclude competition from some relevant market[6] during the years here in question, 1969 to 1973.

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[3] 15 U.S.C. Section 2.

[4] *United States* v. *Grinnell Corp.*, 384 U.S. 563, 570-71 (1966) ["*Grinnell*"]; *California Computer Products, Inc., et al.*, v. *International Business Machines Corporation*, 613 F.2d 727 (9th Cir. 1979) ["*CalComp*"]; *Greyhound Computer Corp.* v. *International Business Machines Corporation*, 559 F.2d 488, 492 (9th Cir. 1977), *cert. denied*, 434 U.S. 1040 (1978) ["*Greyhound*"].

[5] *United States* v. *Griffith*, 334 U.S. 100, 107 (1948); *Berkey Photo, Inc.* v. *Eastman Kodak Company*, 603 F.2d 263 (2d Cir. 1979) ["*Berkey*"]; *Telex Corp.* v. *International Business Machines, Corp.*, 510 F.2d 394, 926-28 (10th Cir.), *cert. dismissed*, 423 U.S. 802 (1975) ["*Telex*"].

[6] *United States* v. *E. I. duPont de Nemours & Co.*, 351 U.S. 377, 391 (1956) ["*duPont*"]; *CalComp*, *supra* n. 4, at 734; *Greyhound*, *supra* n. 4, 559 F.2d at 496.

III.

In general, two types of evidence are relevant to an appraisal of defendant's ability to control price or exclude competition. The first category can be broadly labelled "market structure," and encompasses evidence that is relevant to an estimation of the nature and significance of constraints on defendant's power. The second category, "market performance" relates to a comparison between the actual past functioning of the market and the manner in which monopolized or competitive markets are predicted to function.

A. *Market Structure.*

Economic theory teaches that a monopolist, because it is in a position to control price by varying the quantity of goods it produces and sells, will be able to sell its goods at a price higher than would prevail were the market competitive.[7] As a result it will earn supra-normal profits. In competitive markets, two forces are at work which inhibit the ability of a firm to charge more than the competitive price level and earn more than a normal profit. First, if a producer raises its price above the price for competing goods, then customer demand for the higher-priced article will fall off in favor of cheaper alternatives, and the producer will be forced to lower its price again. Second, even if the producer were able to charge relatively more for its product for a time, the resultant supra-normal profits would lure new competitors into the market, and the additional supply of competing goods that they offer to customers would cause prices and profits to return to competitive levels.[8] If that first force ("demand substitutability") and that second force ("supply substitutability") are sufficient checks upon defendant's power to control price, than the market in effectively competitive. If not, defendant is a monopolist.

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[7] *See* P. Areeda, *Antitrust Analysis* 13 n. 33 (1974).

[8] *Id.*

An inquiry into demand substitutability calls for a definition of the relevant market and measurement of defendant's share of that market.[9] The relevant market is comprised of defendant's product, products that are fungible, and of those products which the customer would consider to be reasonable alternatives.[10] If a small increase in the price of product A will cause customers to shift their allegiance to product B, then the cross-elasticity of demand is high, the products are reasonable alternatives, and they belong in the same relevant market.

The geographic aspects of the relevant market must also be considered.[11] Thus, if small changes in the price of a product in one location will cause customers to turn to alternatives available in another location, then the quantity of reasonably alternative products supplied at both locations should be considered as part of the relevant market. The relevant geographic market is the area of effective competition within which the seller operates and to which the purchaser can practically turn for supplies.[12]

With the relevant market defined, the defendant's share of that market can be measured. A relatively small market share would lead to the inference that monopoly power was not present since the ready availability of substitutes would defeat attempts to use that power. The larger defendant's market share, the stronger is the inference that competitors would be unable to effectively check exercises of monopoly power.[13]

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[9] *Walker Inc.* v. *Food Machinery*, 382 U.S. 172, 177 (1965); *Twin City Sportservice Inc.* v. *Charles O. Finley and Co.*, 512 F.2d 1264, 1270 (9th Cir. 1975); *Case-Swayne Co.* v. *Sunkist Growers, Inc.*, 369 F.2d 449, 454 (9th Cir. 1966), *rev'd on other grounds*, 389 U.S. 384 (1967).

[10] *duPont*, *supra* n. 6, at 395. Note that in some circumstances services or a combination of services and products may provide reasonable alternatives to the selection of a product. *Grinnell*, *supra* n. 4, at 572. The use of the term "product" here does not indicate that this possibility has not been considered.

[11] *Case-Swayne Co.* v. *Sunkist Growers, Inc.*, 369 F.2d 449, 454 (9th Cir. 1966), *rev'd on other grounds*, 389 U.S. 384 (1967).

[12] *Otter Tail Power Co.* v. *United States*, 410 U.S. 366, 369 n. 1 (1973); *Tampa Electric Co.* v. *Nashville Coal Co.*, 365 U.S. 320, 327 (1961).

[13] *See Grinnell*, *supra* n. 4 at 571; *Greyhound*, *supra* n. 4 at 496; *Twin City Sportservice Inc.* v. *Charles O. Finley & Co.*, 512 F.2d 1264, 1270 (9th Cir. 1975); *United States* v. *United Shoe Machinery Corp.*, 110 F. Supp. 295, 343 (D. Mass. 1953), *aff'd per curiam*, 347 U.S. 521 (1954) ["*United Shoe*"].

The distribution of the share of the market not supplied by defendant is also telling. Defendant's share is more likely to indicate monopoly power if the rest of the market is widely distributed among many small competing suppliers than it would be if the size of competitors and the market share held by them approached defendant's size and share.[14]

Under some circumstances it may be proper to apply the concept of supply substitutability to the definition and measurement of the relevant market and to include within the market any suppliers which might readily and easily enter by producing a reasonably acceptable alternative product.

The greater the barriers faced by a new entrant, the more probable it is that control of a particular market share would enable defendant to exercise monopoly power.[15]

Anything that tends to inhibit firms from readily and easily entering the marketplace can be analyzed as an entry barrier. Thus, the capital an entrant would have to invest is a factor, as are the employee skill levels required for a firm to be successful. Product differentiation, product loyalty, or any customer disinclination to accept the product from different suppliers are hurdles the new entrant may have to overcome. And, the existence of economies of scale or a dwindling market demand would make entry difficult.

Within a market, as defined by demand cross-elasticity considerations, economically significant submarkets may exist.[16] Submarkets are zones of actual or potential competition[17] that are sufficiently distinct from the larger market that one firm

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[14] *See Greyhound, supra* n. 4, at 496-97; *Pacific Coast Agricultural Export Association* v. *Sunkist Growers, Inc.*, 526 F.2d 1196, 1204 (9th Cir. 1975), *cert. denied*, 425 U.S. 959 (1976).

[15] *See generally*, L. Sullivan, *Antitrust*, Section 23 at 77 ["*Sullivan*"]; Von Kalinowski, *Antitrust Laws and Trade Regulations*, Vol. I., Section 8.02 [3], p. 8-36 ["Von Kalinowski"].

[16] *Brown Shoe Co.* v. *United States*, 370 U.S. 294, 325 (1962) ["*Brown Shoe*"]; *International T. & T. Corp.* v. *General T. & E. Corp.*, 518 F.2d 913, 932 (9th Cir. 1975).

[17] *International T. & T. Corp.* v. *General T. & E. Corp.*, 518 F.2d 913, 932 (9th Cir. 1975).

could exercise the power to control price or the power to exclude competition within them.[18]

Practical aids in identification of such zones of competition include industry or public recognition of the submarket as a separate economic entity, the product's peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialized vendors.[19] If these indicia indicate a submarket exists, market structure and market performance should be examined to determine whether defendant is in possession of monopoly power.[20]

B. ***Market Performance.***

Evidence of the actual operation of the market or submarket can also provide valuable clues as to the existence of monopoly power. If defendant has, in the past, successfully controlled price or excluded competition, that is direct and convincing evidence that it had the power to do so.[21]

Less direct evidence can also be persuasive. Many courts have examined defendant's profit record on the theory that persistent excess profits are inconsistent with the competitive model and attributable to the possession of monopoly power.[22] Monopoly is also expected to result in technological stagnation. Without a competitive spur, the monopolist is thought not to

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[18] *Cf. Grinnell, supra* n. 4, at 573. Note that existence of a submarket does not necessarily negate the relevancy of the larger market. *U.S.* v. *Phillipsburg National Bank*, 399 U.S. 350, 360 (1970).

[19] *Brown Shoe, supra* n. 16, at 325; *Case-Swayne Co.* v. *Sunkist Growers, Inc.*, 369 F.2d 449, 454-55 (9th Cir. 1966), *rev'd on other grounds*, 389 U.S. 384 (1967).

[20] *See* Von Kalinowski, *supra* n. 15, Vol. I, Section 8.02 [2], p. 8-23.

[21] *Moore* v. *James H. Matthews & Co.*, 550 F.2d 1207, 1219 (9th Cir. 1977); *Power Replacements Corp.* v. *Air Preheater Co., Inc.*, 356 F. Supp. 872, 896-97 (E.D. Pa. 1973).

[22] *duPont, supra* n. 6, at 404; *United States* v. *Aluminum Co. of America*, 148 F.2d 416, 426-27 (2d Cir. 1945) ["*Alcoa*"]; *Banana Distributors* v. *United Fruit Company*, 162 F. Supp. 32, 39 (S.D.N.Y. 1958); *United States* v. *General Electric Co.*, 82 F. Supp 753, 894-95 (D.N.J. 1949). But profit evidence can mislead and should not be too heavily relied on. 2 P. Areeda and D. Turner, *Antitrust Law*, Section 512c, pp. 336-37 (1978); Sullivan, *supra* n. 15, at 84-86.

have any incentive to innovate. Thus, the rate of technological progress in the industry is relevant.[23]

In a competitive industry firms are expected to be "price takers." That is, they will be unable to affect price by variations in the quantity of goods they offer for sale. Where it appears defendant was a "price maker," able to choose among a range of price options in order to achieve its profit goals, or able to disregard cost and set price according to utility to the consumer (functional pricing), it may indicate monopoly power.[24,25]

Market history, in terms of entry and growth of new firms or exit of failed firms, and whether concentration is increasing or decreasing are additional factors that can indicate whether the competitive process is functioning properly or not.[26]

Transamerica asserts that IBM had monopoly power in three markets:

1. The manufacture and placement of general purpose electronic digital computer systems ("systems market");

2. The manufacture and placement of tape drives and their controllers plug-compatible to IBM CPUs ("tape market"); and

3. The manufacture and placement of disk drives and their controllers plug-compatible to IBM CPUs ("disk market").

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[23] *Greyhound*, *supra* n. 4, at 497; *United Shoe*, *supra* n. 13, at 331. *But see* F. Scherer, *Industrial Market Structure and Economic Performance* 363-78 (1970), advancing the thesis that dominated market with low entry barriers is the setting that is most conducive to innovation.

[24] *See* 2 P. Areeda and D. Turner, *Antitrust Law*, Section 507, p. 331 (1978); Sullivan, *supra* n. 15, at 80.

[25] *See* 2 P. Areeda and D. Turner, *Antitrust Law*, Section 514a, p. 341-42 (1978); Sullivan, *supra* n. 15, at 88-89.

[26] *Hudson Val. Asbestos Corp.* v. *Tougher H. & P. Co., Inc.*, 510 F.2d 1140, 1144 (2d Cir. 1975); *Cole* v. *Hughes Tool Co.*, 215 F.2d 924, 938 (10th Cir. 1954); *ILC Peripherals* v. *International Business Machines*, 458 F. Supp. 423, 431 (N.D. Cal. 1978).

C. *The General Purpose Systems Market.*

Computer systems are the functioning combination of hardware (CPUs and peripherals) and software that a user may employ to satisfy data processing requirements. Transamerica draws a distinction between general purpose systems and special purpose systems. Special purpose systems are those that are designed for and dedicated to specialized applications. For instance, a special purpose computer system might be utilized to control a manufacturing or a chemical process. General purpose systems, on the other hand, are those that are capable of easily and economically being adapted to a variety of data processing applications. A general purpose computer system might be used to process a company's payroll, to update its books of account, or to allow its engineers to solve complex mathematical problems while sitting at a remote terminal. Some (but not all) general purpose systems are capable of performing all these tasks concurrently. By definition, all general purpose systems allow the user to switch easily from one task to another.

This Court accepts the view that the market for general purpose computer systems should be analyzed separately from the market for special purpose computer systems. The systems sold to satisfy these different needs are not readily interchangeable and different suppliers specialize in each of the markets.

Transamerica's definition of the systems market is, however, too narrow. Only suppliers of complete systems are included, suppliers of parts of systems are ignored. Firms which offer the user parts of systems have become a major competitive force in the computer industry, and, because they significantly constrain IBM's power to control the price of the system it sells, a market definition that ignores them is incorrect.

At one time the only option a general purpose systems user had was to choose between suppliers of complete systems. If an IBM user was dissatisfied with IBM's peripheral equipment or with IBM's software, the only recourse was to remove the entire IBM system as a unit, and replace it with an entire system from

another manufacturer. Since that time, literally thousands of companies have entered the systems market, not as suppliers of entire systems, but rather as specialists providing users with replacements for parts of their computer systems. IBM did not charge the user one price for an entire computer system, rather they priced each component of their systems individually. That meant that companies which focused on replacing parts of a system could offer the user a better price on that part and the user was still free to acquire the rest of the system from IBM.

The PCMs are perhaps the best example of such specialists. Some PCMs got their start by copying IBM's tape drives and offering them to IBM's systems customers. Other PCMs specialized in replacing IBM's disk subsystems with their own versions. Still others recognized a competitive opportunity in supplying printers for use on IBM's systems, and some PCMs competed with IBM for sales of the electronic memories attached to IBM CPUs.

Entry barriers proved remarkably low, and the PCMs proliferated. Today, a user could replace practically every part of an IBM system with hardware from a PCM. The same is true for software. Software firms offer programs to users of IBM systems that are reasonable alternatives to the programs available from IBM. And the entry barriers faced by an entrepreneur with a software package to sell are truly insignificant.

A market definition should "recognize competition where, in fact, competition exists,"[27] and should include all significant competition even though that competition differs in form or nature.[28] Transamerica's systems market definition fails this fundamental test. By assuming that only manufacturers offering complete systems compete with IBM, Transamerica ignores the fact that IBM systems users had other reasonable alternatives; they could replace parts of their IBM systems. In many ways, partial replacement was a more significant constraining force than total replacement. Customers found partial replacement attractive because it did not involve a scrapping of the user's

[27] *Brown Shoe, supra* n. 16, at 326.

[28] *United States* v. *Continental Can Co.*, 378 U.S. 441, 449-50 (1964).

investment in programming and personnel skills, and it allowed users to reduce data processing costs without abandoning entirely the security of the IBM fold. Partial replacement of parts of IBM systems was a significant constraining force on IBM's market power during the 1969-1973 time period.[29] Billions of dollars worth of equipment was being replaced piecemeal by IBM systems users. A market definition that ignores this cannot be accepted.

Some minicomputers (minis), small, relatively inexpensive computer systems should also have been included in Transamerica's general purpose systems market definition. Transamerica included the smaller IBM systems, but excluded the thousands of minis that were directly competitive with those small IBM systems. That exclusion would have had more validity in the past. When they were first introduced minis were limited, or at least thought to be limited to special purpose applications. But things changed. By May, 1970, *Computerworld*, a widely read industry newspaper, recognized that the " . . . new minicomputers and microcomputers showed drastic changes in design that make them truly general purpose . . .. For the first time, they offer a reasonable alternative to 'full-sized' systems." Advertisements by minicomputer manufacturers emphasized that theme, and apparently users got the message. In August of 1972, *Computerworld* reported:

> "They [minis] are being used as true general purpose computers, running a range of applications such as order entry, sales analysis, payables, receivables, general ledger, inventory control, payroll, price ticket printing and credit authorization . . .."

During the relevant time period minis were being sold as reasonable alternatives to the smaller general purpose systems offered by IBM. When connected together, several minis were a reasonable alternative to the acquisition of larger systems. And minis, whether used as data collection devices, intelligent terminals, pre-processors, or stand-alone systems, could ease the workload of larger general purpose systems, thereby

[29] The IBM actions of which Transamerica complains all took place within a ten month period, September 1970 to July 1971.

providing the user with a viable alternative to the acquisition of a more powerful system. The competition minis provided was significant, and their exclusion from the systems market definition was incorrect.

IBM also faced other constraints not contemplated by Transamerica's systems market definition. Service bureaus buy computing systems and make them available to others by renting out time on them or doing work on them for the benefit of end-users. Time-sharing companies make their computers available to many users who access them concurrently via remote terminals. In both cases, users may turn to such companies during peak periods, or for the specialized services they offer. Leasing companies are financial intermediaries; they buy computer systems, or parts of computer systems, from manufacturers and lease them to users. Service bureaus, time-sharing companies and leasing companies all provide significant competition for IBM. However, their exclusion from the market definition is analytically correct. These companies all buy computers from systems manufacturers, add some financial or technical services, then turn around and offer the computers to the end user. Their basic product is computing power. Their basic raw material is a computer system. Since they all must buy equipment from manufacturers, if one manufacturer has the power to control price at the time of the initial sale, it has the power to indirectly control the price at which the computer re-enters the market with the added services. Where it is possible that a defendant might indirectly control the price at which goods re-enter the market, that alternative source of goods should be excluded from the market definition.[30] But the nature and the volume of the business done by service bureaus, time-sharing companies, and leasing companies need not be totally ignored. Although exclusion from market definition is called for, the constraints these companies provide decrease the likelihood that defendant's market share reflects monopoly power.

This Court agrees with Transamerica's contention that the concept of supply substitutability does not affect the systems

[30] *Alcoa, supra* n. 44, at 425.

market definition since there has been no evidence that any firms are in a position to readily shift their production facilities into the manufacture of general purpose systems, and also agrees that the United States constitutes the relevant geographic market.

Transamerica has made no effort to measure IBM's share of the market as this Court would define it, i.e., including minicomputer manufacturers, software suppliers, and PCMs as competitors. Nonetheless, the evidence of IBM's market share, in the market as defined by Transamerica, will be examined for whatever light it might shed on the issue of IBM's market power.

The most common measurement of market shares is a comparison of the competitors' annual sales.[31] Here, Transamerica, however, has used what is called the "installed base" method.

Included in each company's installed base for any year are all computer systems ever leased or sold by that company which are still in use in that year. Those systems, no matter how old they are, are valued at their original purchase price or their current purchase price, whichever is higher. Transamerica insists that this method is appropriate because the general purpose computer systems market is predominantly a lease market. Any measurement that failed to recognize past activity, they argue, would ignore the substantial revenues IBM enjoys from machines leased and shipped in the past and ignore the substantial hold IBM has on those customers due to software lock-in.[32]

The computer industry is characterized by cyclical development or "generations" of computer equipment. These cycles

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[31] *See United States* v. *Pabst Brewing Company*, 384 U.S. 546, 550 (1966); *United States* v. *Von's Grocery Co.*, 384 U.S. 270, 272 (1966).

[32] Software lock-in is a term used to describe the disinclination of users to switch from one computer manufacturer's line of equipment to another's. If a user were to switch allegiance, it would incur substantial costs in converting its existing programs to the formats required by the other manufacturer's machine. As a result, over 80 percent of all users remain with the same manufacturer when they replace their general purpose systems.

can be expected to produce sharp fluctuations in one company's share of annual shipments, and the tendency of the installed base method to smooth out these swings is another advantage claimed for it.

Installed base is a method traditionally employed by the computer industry, including at one time IBM itself, and this too is a reason advanced for its adoption here.

IBM counters that installed base reflects more history than current market power. IBM is right. IBM has been successful in the computer field almost since the industry's inception. Thus, inclusion of all IBM machines still in use distorts their share. The successes of newer companies (such as the PCMs) are camouflaged by the large installed bases of more established manufacturers.

The installed base method credits IBM with purchased machines from which it no longer enjoys any revenue, and even with machines that have come back into the market to compete against it. Machines sold in an earlier year to leasing companies, time-sharing companies, service bureaus, and used machines are all attributed to IBM's market share in later years. Transamerica insists this is proper because IBM, as the original manufacturer, indirectly controls the prices at which such machines and services can be offered. While such reasoning supports an exclusion of this competition from market definition, it does not warrant an attribution of the value of their capital equipment to the manufacturer's market share except in the year of the initial sale.[33]

The lease nature of the business is an insufficient reason for abandoning an annualized approach. By 1973, less than half of IBM's general purpose systems were leased. And if software lock-in, or any other factor, persuades users not to switch vendors, then the future successes that installed base would predict will ultimately be reflected in annual shipment data. One of Transamerica's industry market share experts, recognizing the infirmities of installed base, recently discontinued his use of that method.

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[33] Transamerica's reliance on *Alcoa, supra* n. 44, at 424-25, is misplaced. The Court there excluded secondary ingot from the market definition. It did not include the secondary ingot in defendant's market share.

It is not necessary to discard all of Transamerica's data because the installed base measurement method is unacceptable. Annual shipments can be approximated from the installed base figures in evidence by subtracting one year's installed base from the following year's. This will yield a figure for net shipments. Net shipments appear to be a more desirable indicator than gross shipments because many computers are shipped to users who return their older machines to the manufacturer. Cyclical fluctuations can be accounted for by averaging the share figures for several years.

In some of its data Transamerica has included the value of equipment placed by the PCMs as part of IBM's share. This is clearly incorrect, and Transamerica has offered no convincing rationale for it. It would be possible to rehabilitate this data by extracting from IBM's share the value of disks and tapes supplied by PCMs. However, the value of PCM supplied printers, electronic memories, and other gear cannot be separated out, providing still another reason for viewing the resulting figures cautiously.

IBM's share of net shipments (less all PCM products) has been calculated to be: 65.4 percent; 67.9 percent; 51.4 percent; 56.4 percent; 56.5 percent; 30.6 percent; and 64.4 percent, for the years 1969 through 1975 respectively. Over the entire seven-year period IBM shipped 57.4 percent of all general purpose systems (net). The next largest share was shipped by the PCMs as a group with 14 percent over the seven years. Burroughs was the second largest manufacturer of systems with 7.7 percent, following by Univac with 4.9 percent, and Honeywell with 4.6 percent.[34]

Even in a properly defined market these market share statistics would not be overwhelming. Other courts have doubted whether sixty percent of a market would be enough.[35] But while a finding of monopoly power is not foreclosed by IBM's share if the setting is conducive to the exercise of such

[34] *See* defendant's exhibits 6183 and 6515A.

[35] *Alcoa, supra* n. 44, at 424.

power and if other indicators confirm its presence,[36] such a finding is certainly not compelled by these market shares.

The distribution of the remainder of the market serves to enhance IBM's power. No single manufacturer approaches the success IBM enjoys. However, their shares are growing while IBM's is shrinking. IBM's share tends generally downward, indicating that monopoly power is not present, or, if present, that the monopolist's grip is weakening.

Consistent supra-normal profits may be attributable to an ability to control price. Here IBM's profits have been very substantial. Its after-tax return on equity during the 1964 to 1973 period was consistently 30 to 70 percent above the Fortune 500 median, while its after-tax return on sales doubled and sometimes tripled the industrial giants' median. But the inference that a defendant that enjoys healthy profits only does so because of an unhealthy market structure is not a strong one. Good management, superior efficiency and differences in accounting provide explanations that are just as plausible, and none of those explanations is inconsistent with an effectively competitive market.

One thing excessive profits can be expected to result in is increased entry by firms hungry to participate in the rich rewards. Transamerica says that this has not occurred because the entry barriers faced by potential entrants are insurmountable. It is true that enormous barriers are faced by firms wishing to enter this market as suppliers of complete computer systems. Between $500 million and $1 billion in capital would be required; a national network of sales and maintenance offices staffed with highly skilled personnel is imperative; the entrant would have to fund research and development projects; a broad product line must be offered; and customer loyalty due to software lock-in would have to be overcome. Because such a large commitment would be involved for entry as a systems supplier, it is not surprising to find that there has been no new entry on that basis since the early 1960's.

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[36] The Ninth Circuit has expressly affirmed findings of monopoly power where defendant's share was 45-70 percent. *Pacific Coast Agr. Export Association* v. *Sunkist Growers, Inc.*, 526 F.2d 1196, 1204 (9th Cir. 1975), *cert. denied*, 425 U.S. 959 (1976).

The flaw in Transamerica's entry barrier analysis is a consequence of its market definition error. Competition and entry in this market does not occur on only a full-system basis. Entry could, and did occur where companies recognized profitable opportunities in less inclusive offerings.

Storage Technology Corporation, one of the most successful PCMs, was started by a bright engineer with $225,000 in equity capital, and experienced phenomenal growth. It was not alone. In 1970, International Data Corporation (IDC), a company specializing in statistical studies of the computer industry, reported:

> "Just 15 years ago, the number of companies in the infant industry could be counted on the fingers of one hand; today well over 4,000 companies produce computers, related equipment and supplies, or offer data processing and programming services."

IDC thought there had been "an explosive proliferation of options for the computer user." In 1971, Transamerica, in a presentation to its parent Board of Directors, agreed, saying:

> "The frequency of entry into the data processing industry is quite high compared with any other industry, and there are usually, at any one time, more competitors than anyone would really like to have."

The new entrants were growing. From 1967 to 1975 the value of PCM equipment attached to IBM systems increased from $15.8 million to $2.6 billion. In the same period, leasing companies jumped from holding 8.3 percent of the IBM CPUs to 26.7 percent. And the market as a whole was growing; most of IBM's full-systems competitors participated in that growth. Digital Equipment Corporation (DEC), for example, was founded in 1957 with DEC initial capitalization of $70,000. By 1977 it had computer related revenues of $1.1 billion. One commentator has referred to IBM's systems competitors as the "billion dollar dwarfs."

This is not the story of a stagnant, dominated industry. There is no doubt that the pace of technological progress in the

computer industry is extraordinary. Commentators are fond of saying that had the auto industry kept the same pace over the last 30 years, a Rolls-Royce would cost $2.50 today and would have an EPA gas rating of 2,000,000 miles per gallon.

There is some evidence that IBM sought to maximize profits by choosing a price for its products from a range of alternative prices. But that is not necessarily inconsistent with an effectively competitive market. The range of price options available to IBM was never so broad that it would set a price without regard to competitors' prices. And, in most cases, the range was only theoretical, because competitive pressures, not IBM preference, dictated which price had to be adopted.

This market was not monopolized. IBM did not control prices, it reacted to the prices set by others. IBM's market share (if the market had been properly defined) was below 57 percent and falling. Entry was easy for anyone with a good idea and the courage to exploit it, and new entrants, along with the old, grew and prospered. This Court finds that Transamerica has failed to prove that IBM had monopoly power in the general purpose systems market.

Nonetheless, Transamerica's other contentions will be considered on the assumption that IBM *did* have such monopoly power.

D. *Tape and Disk Markets.*

The hardware of a computing system was previously described as consisting of a CPU and peripherals. Further refinement of that over-simplification is necessary for an understanding of the peripherals markets alleged to be relevant.

Certain control functions must be performed if peripheral gear is to function properly. The access arm of a disk drive, for example, must be positioned over the proper track before data can be read from, or written onto that track. These control functions can be performed by the arithmetic and logical circuits of the CPU, in which case the control function is said to be "integrated" into the CPU. But when the CPU is tied up with control functions, it is not free to perform more sophis-

ticated tasks, and so an alternative design was incorporated into the architecture of System/360. Most of the peripherals attachable to System/360 CPUs were not integrated. The control functions were performed by two independent "boxes" or machines with arithmetic and logical circuits: channels and control units.

A limited number of channels could be attached to most System/360 CPUs. Channels funnel data into the CPU's main electronic memory, and take from the memory data that is to be written onto any of the peripheral devices that may attach to the channel, and send it to its destination. Channels perform control functions common to a variety of peripheral gear.

It is possible to attach a number of control units to each channel on the system, and the peripheral devices attach to the control unit. Control units perform the control functions that are required by the specific type of peripheral that attaches to it. Thus, one type of tape drive, expecting specific control functions to be performed, only attaches to a specific type of control unit. Other types of tape drives require a different control unit, and the same is true of disks. But various types of control units can be attached to the same channel.

PCMs typically supplied a combined package of disks and disk control units attachable to, or "plug-compatible" with, IBM channels. This meant that the user could remove the IBM control unit and disk combination (known as a "subsystem"), plug in the PCMs' replacements and the computing system would continue to function with very little inconvenience. That was so because the PCMs had duplicated the "interface" between the IBM channel and the IBM disk control units. An interface has both physical aspects (in terms of the number of wires involved and their arrangement in a connector), and protocol aspects (what a given pulse sequence on a particular wire is understood to indicate by the machine receiving the pulse).

Unlike PCM disk suppliers who provide subsystems, PCM tape suppliers concentrated initially on tape drives and generally did not sell tape control units. Thus, the interface that they duplicated was the interface between IBM tapes and IBM control units.

Although many computer manufacturers designed their systems with this CPU-channel-control unit-peripheral hierarchy of control functions, no other systems were designed so that the interface between the channel and control unit (disks) or the interface between the control unit and peripheral device (tapes) was precisely the same as the corresponding IBM interface. Thus, tape drives and disk drive-control unit combinations developed for use on IBM's System/360 could not, without some interface modifications, be plugged into another computer manufacturer's system, and vice versa.

The two peripherals markets alleged by Transamerica consist of tape drives and tape control units, and disk drives and disk control units that can be plugged into IBM CPUs without any modifications, i.e., that are plug-compatible.

These peripherals markets will be examined together. Both markets, if they can be so described, became economically significant in the late 1960's, when PCMs began duplicating the peripherals that would attach to IBM's computers. Prior to that time some of the PCMs supplied peripherals to IBM's general purpose systems competitors, who then incorporated them into the systems they offered. When the systems competitors took to manufacturing their own peripherals, the PCMs turned their attention to marketing peripheral replacements to IBM users.

Having already accepted a definition of a systems market that encompasses all the economic activity on the peripherals front, perhaps "submarket" would be the proper term to apply here. In any event, the *Brown Shoe* submarket indicia can provide valuable clues as to whether plug-compatible tapes and control units and plug-compatible disks and control units are sufficiently distinct that they could be monopolized.

Industry recognition of the peripherals markets as separate economic entities could hardly be more evident. IBM studied the "tape market" and the "disk market" separately and referred to them repeatedly by those or similar appellations. Others in the industry, including witnesses called by both sides, referred to and treated the tape and disk markets as separate economic entities.

The peculiar uses and characteristics of the products involved have already been spoken of. Because the interfaces between IBM CPUs and control units and between IBM control units and peripherals were unique, the tapes or disks described as plug-compatible to IBM CPUs could only be used with those CPUs. Users with systems provided by other manufacturers could not use them at all, and IBM users could use nothing else. Thus, customers for plug-compatible tapes and disks were readily identifiable and distinct.

The production facilities for tapes were different from the production facilities for disks, and both were different from the production facilities for other components of the system. IBM's main disk facilities were in California; its main tape facilities in Colorado; and its CPUs were manufactured elsewhere. However, the production facilities of independents and systems manufacturers producing non-IBM-plug-compatible tapes and disks were probably not so different from the facilities for the corresponding plug-compatible peripherals. This is so because the tapes and disks were similar in almost all respects save for the unique interface electronics.

Prices were distinct. In setting its prices IBM was less influenced by the prices of non-plug-compatible tapes and disks than by the PCMs' prices. Users were price sensitive. Lower prices for equivalent or superior performance was the PCMs' selling point. With it they managed to attract millions of dollars worth of business away from IBM.

Finally, the PCMs were specialized. Peripherals were their major activity. Many supplied only plug-compatible tapes or only plug-compatible disks. Those that supplied both, made the combination only after experiencing an initial success with the one device or the other. The *Brown Shoe* submarket criteria indicate that the peripherals markets are capable of being dominated, and the markets should be examined further.

IBM attacks these markets as narrow for three reasons: (1) they ignore the interchangeability between tapes and disks; (2) they fail to include as potential suppliers either the systems manufacturers who make their own peripherals, or the inde-

pendents who manufacture peripherals for them; and (3) they fail to account for the constraint of systems competition on peripheral price discretion.

IBM's first argument, that tapes and disks are interchangeable, is without merit. In configuring a system, users have several alternatives. Various types of media are available to store and access data. Principal among these are tapes, disks and electronic memory. In that order, data is accessed by the CPU with increasing rapidity, but also with increasing cost. Electronic memory is so expensive that it is only used as a temporary storage area for data. Data is read into the electronic memory (from a tape or disk perhaps) where the CPU can readily access and work with it, then written from electronic memory onto another medium for more permanent storage. Electronic memory is not really a peripheral, rather more a part of the CPU itself, and is not a reasonable alternative to either tape or disk.

For some applications a disk must be used. Where the CPU must access data frequently, but not necessarily in a serial fashion, a disk is indispensable; tapes are not an alternative regardless of the price differential. Applications where many users access a central computer through remote terminals (such as an airline reservations system) are only feasible if the data for them is kept on disk (or other direct access device). This is so because every data record on a disk pack can be reached within a fraction of a second by a lightning-quick access arm.

To reach a particular record on a tape, the tape reel must be spun until the proper spot is reached. It might take as long as one minute to reach a particular data record, ages by comparison with disk speeds. However, if the records on a tape reel are sorted so that the CPU can access them seriatim, then the time required to access records in a tape file is quite acceptable. So, tapes are typically used only for data which can be accessed serially, and only disks are used when data must be accessed randomly. Still, there is some overlap.

For some serial data files either a tape or disk can be used. Because the cost of storing data on disks is much greater than the cost of tape storage, only with relatively short files would

the user consider tape and disk to be alternatives. Most system users employ both disks and tapes.

Indications are that the incidence of actual substitution between tape and disk is not high. Neither IBM nor the PCMs considered tape prices when pricing disks or vice versa. IBM's Financial Procedures Manual calls for calculation of the impact on existing products' profits caused by introduction of a new product. If tapes and disks were reasonable alternatives, one would expect that a new tape would impact the profitability of old disk products and that new disk devices would impact the profits of existing tape products. Yet, only rarely were such impact calculations made. The manual also calls for competing products to be identified. Tapes were not so identified when disks were introduced, nor were disks, when tapes were introduced.

The head of IBM's Computer Division testified that slight variations in the price of disks would not affect the demand for tapes; that variations of 40, 50 or 100 percent in price would be required. That is not the high degree of price cross-elasticity that is required if two products are to be considered reasonable substitutes and placed in the same market.

IBM's second argument for a broader market definition, supply substitutability, calls for the inclusion of firms with a high cross-elasticity of production. This contention would require a finding that producers are capable of quickly and easily entering the market to produce alternatives. That finding cannot be made. Producers of non-plug-compatible peripherals would have to change the interfaces in their devices to cope with IBM's CPUs. Interface changes would cost hundreds of thousands, if not millions of dollars, and might require a year to carry out. Under these circumstances it would be improper to include this potential competition in the peripherals market definition.

IBM's third attack, emphasizing the influence of systems competition, has merit. The cost of peripherals accounts for 50 to 70 percent of the total cost of a typically configured general purpose computer system. Efforts made at controlling price in

the peripherals submarkets would be felt by systems market competitors because control of peripheral prices translates indirectly into control of systems prices. If the systems market were effectively competitive, one would expect that the pressures exerted by that competition would be sufficient to defeat attempts to wield monopoly power in a peripheral submarket. Thus, the existence of monopoly power in a peripherals market must be predicated upon a finding of monopoly power in the systems market.

Transamerica's expert economist agreed. He testified that by definition IBM could not have monopoly power in the peripherals market if it did not have monopoly power in the systems market. This Court's conclusion that IBM lacked systems market monopoly power is thus fatal to Transamerica's peripheral markets claims. Nonetheless, this inquiry will proceed under the assumption that IBM had a systems monopoly.

As with the systems market, Transamerica combined a narrow definition of the peripherals market with a distorting share measurement technique, the installed base. Installed base measurement makes even less sense here than it did in the systems market. For many years, IBM faced absolutely no competition for the tapes and disks that attached to its CPUs. As a result, it built a tremendous installed base of those peripherals. Even if the PCMs had won every sale from 1968 onward, many years would have to pass before the installed base figures would show PCM competition was significant. And the software lock-in argument rings hollow here. By definition, every product in these markets is plug-compatible; none of the competitors enjoys any advantages traceable to software lock-in.

Transamerica's mistaken failure to recognize systems competition in its market definition invalidates its share measurement data. However, the net shipments of peripherals in the market, as Transamerica has defined it, can be calculated in the same manner as net shipments were calculated for the systems market. The installed base at the end of one year is subtracted from the installed base at the end of the following year to indicate net shipments over that year. Thus, the 1969 net

shipment figures were calculated by subtracting the 1968 year end installed base from the 1969 year end installed base. Years prior to 1969 are ignored. Before that time PCM competition was insignificant and IBM's net shipments were almost 100 percent of all net shipments of tapes and disks that hooked onto its CPUs.

The following two tables show the total net shipments of peripherals (drives and control units) for the years 1969 through 1975 as derived from the installed base data.[37] IBM's share appears both in dollars and as a percentage of total. That portion not attributable to IBM was divided amongst the PCMs. Dollar figures are shown in terms of thousands of dollars of monthly rental value.

TAPE MARKET

	1969	1970	1971	1972	1973	1974	1975	1969-75
Totals	5,760	737	519	-19	1,443	4,144	2,569	15,155
IBM	4,547	105	-587	-470	544	2,409	1,618	8,167
IBM%	78.9%	14.3%	*	*	37.7%	58.1%	63%	53.8%

DISK MARKET

	1969	1970	1971	1972	1973	1974	1975	1969-75
Totals	7,838	15,594	627	5,204	10,376	21,738	16,772	78,158
IBM	7,248	13,423	-3,095	3,809	7,155	18,409	13,240	60,237
IBM%	92.5%	86.1%	*	73.1%	69%	84.7%	78.9%	77.1%

*-Loss

It would be difficult to conclude that a company possessed monopoly power in a market where its net shipments were negative at the very time it allegedly used or maintained that power. That is the case here. In 1971, IBM was losing ground to its PCM competitors. That was a relatively lean year for everyone, but more so for IBM than for its competitors. The PCMs were increasing their customer base at IBM's expense.

[37] *See* defendant's exhibits 6528 and 6533.

Even the aggregate numbers are unconvincing. IBM's mere 53.8 percent of the tape market suggests monopoly power is not present. The 77.1 percent figure in the disk market would support a monopoly finding, but the significance of this market share is diminished by the realization that IBM had 100 percent of the market only a few years before, and the failure of the market definition to account for systems competition means these numbers must be viewed circumspectly. These share figures are also inflated by Transamerica's inclusion into the market of products which the PCMs never duplicated, and areas of the country where PCMs chose not to compete.

. Entry barriers around these markets are extraordinarily low. The market definition excluded potential suppliers (such as systems competitors and their independent peripherals sources) because they were incapable of quickly and easily supplying substitute products. But the hurdles those potential suppliers must clear are far lower than those new systems market entrants face. Firms already producing peripherals have the production facilities, the trained staffs, and the research and development expertise needed; all that remains for them is to study the IBM interface and duplicate it. Two of the most prominent systems competitors, Univac and CDC, have done just that. Both manufacture peripherals for their own computer systems, and also manufacture IBM plug-compatible peripherals that compete in the markets at issue here. And many PCMs market their wares to other systems manufacturers as well as to IBM end-users. While the cost, in time and money, of developing an interface is sufficient to exclude systems manufacturers and independents from the market definition, it does not provide a formidable entry barrier around the market as defined.

The entry barriers faced by completely new entrants into the peripherals market have already been discussed in relation to the systems market. Those barriers are low, as is demonstrated by the history of entry into peripherals manufacture. PCMs, attracted by IBM's high profits on its peripherals, stormed these markets and flooded them with cheaper copies of the IBM gear. IBM, unable to maintain its relatively high price, was forced to react with lower prices and improved products. This picture is

consistent with the dynamics of an effectively competitive market, not a monopolized one.

This Court will not be misled by the share figures propounded by Transamerica. Those calculations ignore the significant constraint of systems competition, and measure the markets as an aggregation of all peripherals in use, when there is no reason for doing so. Accurate share figures cannot be determined from this record, but the data which can be rescued indicates that IBM did not have market control, and that its share was not dominant. Entry barriers are low, and entry has been easy, frequent, and successful. Even if a systems monopoly were not a prerequisite to peripheral market control, or even if IBM had a systems monopoly, this Court would find, as it does here, that Transamerica has failed to prove that IBM had monopoly power in either the tape or the disk market.

IV.

PRICING CONDUCT

A defendant not in possession of monopoly power may nonetheless incur antitrust liability by attempting to monopolize. Transamerica alleged that IBM attempted to monopolize by its pricing conduct, by its design conduct, and by its long-term leases. IBM's conduct will be examined first under the assumption that IBM did possess monopoly power. Following that, the conduct that would have violated the monopolization provision of Section 2 will be re-examined to determine whether, in light of the absence of monopoly power, an attempt to monopolize has been proved.

IBM responded to the lower prices and increased successes of the PCMs by offering some of its own products at substantially reduced prices. Transamerica claims that those prices were predatory and violated the antitrust laws.

The concept that prices can be used as a means of acquiring or maintaining monopoly power is not new; it has long been recognized that financially powerful firms might coerce or destroy their rivals by pricing at unremunerative

levels. Attempts to distinguish between predatory pricing and legal price behavior, by comparing defendant's costs with its prices, are new. In an article published in 1975, Professors Areeda and Turner suggested that pricing conduct should be conclusively presumed legal if price levels exceeded either defendant's average variable cost or defendant's short-run marginal cost.[38] Reaction to the Areeda and Turner proposal has been mixed. Courts have embraced it; academicians have criticized and rejected it.

An understanding of the relationship between these cost measures is critical to an appreciation of the effect that imposition of the Areeda and Turner rule would have. All three kinds of cost (average cost, average variable cost, and marginal cost) will at first decline, then later increase as a firm's output is expanded. Average cost (which includes both fixed and variable costs) will always be greater than average variable cost (which only includes variable costs). At low output levels, marginal cost will be less than both of the other cost measures. As output is increased, marginal cost will rise until at some point it will be greater than average variable cost (but less than average cost). If output is increased still further, marginal cost will increase to the point that it exceeds both average cost and average variable cost.[39]

A monopolist has the power to control market price by varying the quantity of goods it offers for sale. As that quantity is varied, the monopolists' marginal, average variable, and average cost will also vary. If market demand would permit it,[40] the monopolist would have the following options: 1) setting a market price in excess of both average cost and marginal cost; 2) setting a market price below average cost but greater than

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[38] Areeda and Turner, *Predatory Pricing and Related Practices Under Section 2 of the Sherman Act*, 88 Harv. L. Rev. 697 ("Areeda and Turner"). Areeda and Turner recognized that marginal cost data are typically unavailable, and suggested that average variable cost could be used as surrogate. *Id.* at 716-18. The terminology and definitions employed here are the same as used by Areeda and Turner. *See id.* at 700-03.

[39] For a diagramatic representation of the relationship between these cost measures and the quantity of output, *see id.* at 701, n. 14.

[40] The monopolist would only have these options if the demand curve intersected the average cost curve to the left of minimum average cost.

marginal cost; or 3) setting a market price below both average cost and marginal cost. Areeda and Turner would conclusively presume the monopolist's conduct legal if it exercised option 1) or option 2), and would conclusively presume conduct illegal only if option 3) was chosen.

IBM argues that the Areeda and Turner rule is the law of the Ninth Circuit and is binding upon this Court. Transamerica maintains that prior cases are distinguishable, and that a monopolists' pricing is illegal if it sets a market price below the point at which it would maximize profits if the purpose and effects of that action are to unnecessarily exclude competition. Neither standard is appropriate in this case. If a monopolist, in response to actual or threatened entry into a previously controlled market, reduces prices below its full cost, there are strong implications of conduct that unreasonably restricts competition. Therefore, and for reasons hereinafter stated, the IBM conduct will be judged against a "full cost" standard.

A. *Predatory Pricing Case Law.*

In 1976, the Ninth Circuit Court of Appeals, in *Hanson* v. *Shell Oil Co.*[41] *("Hanson")*, held that a plaintiff's failure to show that a defendant's prices were below its marginal or average variable costs was a failure as a matter of law to present a *prima facie* predatory pricing case under Section 2. One year later, in *Janich Bros., Inc.* v. *American Distilling Co.*[42] *("Janich")*, the Ninth Circuit, relying heavily on Areeda and Turner, upheld a directed verdict against a plaintiff whose proof suffered from the same insufficiency. If those cases are binding upon this Court, in this case, then, as IBM suggests, Transamerica's predatory pricing allegations must fall as a matter of law, for there was no evidence of any IBM price below marginal or average variable costs.

Both *Hanson* and *Janich* involved non-monopolists, charged with attempting to monopolize. In attempt cases, a plaintiff must establish specific intent to control prices or destroy competition, predatory or anticompetitive conduct, and dangerous probability of success. But it may be misleading to list those three as separate and independent elements. In fact,

[41] 541 F. 2d 1352 (9th Cir. 1976), *cert. denied*, 429 U.S. 1074 (1977).
[42] 570 F.2d 848 (9th Cir. 1977), *cert. denied*, 436 U.S. 921 (1978).

there is a great deal of interrelation between them. Specific intent may be established by direct evidence, such as memos or statements made by corporate officers, or alternatively, specific intent can be inferred from the defendant's conduct.[43] Dangerous probability can be shown by proof of substantial power in a relevant market, or it can be inferred from conduct which independently violates Section 1 and is of a kind "clearly threatening to competition or clearly exclusionary," or it can be inferred from specific intent.[44] In extreme cases only conduct need be proven directly; specific intent can be inferred from the conduct and dangerous probability can be inferred from the specific intent.[45]

A firm that prices its product at levels above marginal or average variable cost is not necessarily engaged in clearly exclusionary conduct. A firm that prices its products below those levels is. These standards then, are appropriate for judging the pricing conduct of a firm charged with attempting to monopolize where no independent evidence of specific intent and no independent evidence of dangerous probability (relevant market proof) is admitted. *Hanson* and *Janich* were such cases, and the application of very strict standards to plaintiff's proof was proper in those circumstances.

However, less egregious conduct may violate Section 2 if engaged in by a monopolist[46] or by one attempting to monopolize if there is also direct proof of specific intent or direct proof of a dangerous probability of success.[47] *Hanson* and *Janich* are deemed therefore to leave open the appropriate standards to apply to cases with different facts.

The same is true of *CalComp*.[48] IBM thinks *CalComp* foreclosed any further inquiry by adopting the Areeda and

[43] *Id.* at 853.

[44] *Id.*; *Hallmark Industry* v. *Reynolds Metals Co.*, 489 F.2d 8, 12 (9th Cir. 1973).

[45] *Janich*, *supra* n. 42, at 854 n. 4.

[46] *Alcoa*, *supra* n. 44.

[47] *Greyhound*, *supra* n. 4, at 504-05.

[48] *Supra* n. 4.

Turner marginal cost standard. *CalComp* dealt with the pricing conduct of a monopolist and decided that if prices were reasonable they did not violate the law, and that price reductions which responded to lower prices of competitors, but still left defendant's products "substantially profitable," were reasonable.[49] However, *CalComp* carefully limited its pronouncements to the facts of the case before it. The court recognized that on a different showing, even profitable prices might violate Section 2 if set by the monopolist to discourage new entrants (limit pricing), and also held out the possibility that other aspects of a defendant's conduct might make prices in excess of marginal cost predatory.[50] Those "refinements" are at odds with the fundamentals of the Areeda and Turner analysis, where it was argued that the prices should be conclusively presumed to be legal if they exceeded marginal or average variable cost.[51]

It does not seem warranted to conclude that the *CalComp* opinion mandates adoption of a conclusion it flatly contradicts.

B. *Prices Above Average Cost Should Be Conclusively Presumed Legal.*

Theoretical "perfect" competition does not contemplate stasis. Economists realize that the prospects of supra-normal profits will induce entrepreneurs and innovators to supply new markets or invent new products. For a time, the innovator will be the market's sole supplier, in possession of monopoly power, and able to charge a profit maximizing price, with returns well in excess of "normal" profits. This is the reward that accrues to those whose ventures into new fields are successful.

Charging a monopoly price and earning monopoly profits is in no way anticompetitive. To the contrary, it can provide the competitive incentive that keeps an economy dynamic and innovative. But the monopoly power that accrues to the innovator is not expected to be permanent. High profits will attract imitators. Initially, the imitators will price their products

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[49] *Id.* at 741.

[50] *Id.* at 737.

[51] Areeda and Turner, *supra* n. 38, at 732-33.

incrementally below the innovators', sufficiently low to attract customers for the goods they can produce, sufficiently high to preserve as much profit to themselves as possible. Eventually the market's supra-normal profits will attract enough new entrants so that the price will be driven down to the point where all suppliers are covering their costs and enjoying no more than a normal profit on their investment (price will equal average cost). This state of perfect competition will continue until another innovator starts the innovation-monopoly-imitator-competition cycle over again.

However, the monopolist may seek to disrupt that competitive process in order to preserve to itself the benefits of monopoly. For instance, when faced with competition, the monopolist might choose to price so low that the new entrant, no matter how efficient, is driven out of business. Once that is accomplished, the monopolist can return to profit maximization and supra-normal profits. Extinguishing the competitive threat in that fashion also serves to raise entry barriers. Potential entrants will be on notice that even if they have a good product, efficiently produced and marketed, the monopolist will not allow them to sell at a price which returns a profit.

The great problem in fixing a legal standard by which pricing conduct should be measured is that it is extremely difficult to distinguish between a monopolist's price reduction that is a normal, expected component of the dynamic competitive process, and the predatory, undesirable conduct just described. If the law is overzealous in guarding against predatory pricing, it may well inhibit the competitive dynamics it seeks to promote.

It is tempting to consider the monopolist's intent in order to distinguish between pro and anticompetitive price reductions. But where is the line between illegal, undesirable, "predatory intent" and the legal, desirable intent to prevail in the competitive struggle? Appropriately low prices are to be encouraged, not discouraged. The punitive impact of the antitrust laws must not be permitted to compel high prices. Unless some objective, understandable standard is established for the guidance of businessmen, they must either forego competitive price

decreases or risk punitive damages that might turn on some careless word once spoken in a board room.[52] Businessmen must have notice of what is violative of the law. A test based strictly on intent would not serve that goal.

The first issue to be addressed in adopting a cost-based test is whether any range of pricing conduct should be beyond the reach of the law. A "free zone" of price activity would preserve competitive incentives, but could also sanction undesirable conduct. If monopolists are allowed with impunity to lower price to a level equal to their average cost, then the monopolist might lower its price from the profit maximizing level to a level competitors cannot meet in order to discourage entry and preserve the monopoly (limit pricing). Or, entry could be defeated and discouraged by temporary reductions to average cost levels, followed by a return to monopoly pricing once the threat had been vanquished. In either case, the competitive process would be thwarted, and the monopolist could preserve its status without risking antitrust liability.

Areeda and Turner considered these possibilities, but concluded, as this Court does, that preservation of incentives is more important than the minimal threat to competition presented by a free zone above average cost. Only less efficient competitors would be eliminated by price manipulations above the average cost level. Competitors who are as efficient as the monopolist will continue to make at least normal profits, while the more efficient will profit more.[53]

It would be all but impossible to distinguish between above cost limit pricing conduct and a monopolist's procompetitive reaction to lower priced competitors.[54] One external characteristic is common to both cases, a lowered price. Any attempt to attach liability to the one will surely inhibit the indistinguishable other.

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[52] *See* Areeda and Turner, *supra* n. 38, at 699; R. Posner, *Antitrust Law: An Economic Perspective*, 189-90 (1976) ("Posner"); Williamson, *Predatory Pricing: A Strategic and Welfare Analysis*, 87 Yale L.J. 284, 287-88 (1977) ("Williamson").

[53] Areeda and Turner, *supra* n. 38, at 704-09.

[54] Posner, *supra* n. 52, at 195 n. 39.

Even a monopolist is permitted to compete in the battle for trade.[55] And the preservation of competitive incentives, even for that monopolist, is deemed such an important consideration that monopolization is condoned where condemnation would provide a disincentive to compete.[56] Protection of relatively inefficient competitors is a lesser consideration.[57] Monopolists can compete by being more efficient than their rivals,[58] and the most significant manifestation of that efficiency is a lower price. If the monopoly is attained or preserved because the monopolist is profitable at price levels where others are not, so be it. Lower prices and increased efficiency are to be fostered. This Court agrees with Areeda and Turner that price reductions which result in prices that exceed defendant's average cost should be conclusively presumed legal.[59]

C. *Prices Below Average Cost Should Not Be Conclusively Presumed Legal.*

Efficiency is no longer the sole determinant of survival once price is permitted to drop below the monopolists' average cost; cash reserves become paramount. If price is insufficient to cover average cost, the monopolist will be losing money, less efficient rivals will be losing money, equally efficient rivals will be losing money, and quite possibly, even *more* efficient rivals will be losing money. Average cost is the breakeven price level. Competitors with average costs equal to the monopolist's, break even when the monopolist does. Competitors with average costs lower than the monopolist's are more efficient and are making a profit when the monopolist is just breaking even. If a monopolist is permitted to set price as low as marginal cost with impunity, it can drive from the market all competitors whose average costs exceed the monopolist's marginal costs unless their staying power is as great as the monopolist's.

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[55] *Greyhound*, *supra* n. 4, at 498-99; *Telex*, *supra* n. 5, at 927.

[56] *Berkey*, *supra* n. 5, at 273-74.

[57] *Hanson*, *supra* n. 41, at 1358-59.

[58] *Otter Tail Power Co.* v. *United States*, 410 U.S. 366, 380 (1973); *United Shoe*, *supra* n. 13, at 342.

[59] *See also International Air Ind., Inc.* v. *American Excelsior Co.*, 517 F.2d 714, 723 (5th Cir. 1975), *cert. denied*, 424 U.S. 943 (1976); *Weber* v. *Wynne*, 431 F. Supp. 1048, 1059 (D.N.J. 1977).

The difference between these cost levels can be quite significant. Evidence in the case at bar suggests IBM's marginal costs or average variable costs might be as little as 50 percent of their average costs. If that is so, then IBM could destroy rivals who are twice as efficient (their average costs are one-half of IBM's), simply because IBM had a bigger bankroll, and fear no antitrust liability under the Areeda and Turner rule.

Courts which have adopted the Areeda and Turner rule have not always considered its potential for abuse. In *Int'l Air Ind. Inc.* v. *American Excelsior Co.*,[60] the court recognized that equally efficient rivals could be driven out but incorrectly assumed that more efficient competitors were safe.[61] The court in *Weber* v. *Wynne*[62] acknowledged the threat to equally efficient firms, but said nothing of the fate of the more efficient.[63] The Court in *Hanson* thought only the less efficient were endangered:

> "If its prices were above its [marginal or average variable] costs, and nevertheless Shell's did drive Hanson out of business, this can only be because Hanson was so inefficient that at prices at which Shell could make a reasonable profit he could not."[64]

And finally, *CalComp* perpetuated that misconception in this Circuit:

> "The thrust of this analysis is that price reductions set up to the point of marginal cost are consistent with competition on the merits, since in this case only less efficient firms will be disadvantaged, while a firm pricing below marginal cost by definition incurs losses so that

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[60] 517 F.2d 714 (5th Cir. 1975), *cert. denied*, 424 U.S. 943 (1976).
[61] *Id.* at 724.
[62] 431 F. Supp 1048 (D.N.J. 1977).
[63] *Id.* at 1060 n. 16.
[64] *Hanson, supra* n. 41, at 1358.

competition on the basis of efficiency in this situation is frustrated."[65]

Average cost is the point to which the normal forces of competition will tend to lower price. To repeat what is self-evident, if a firm sells below its average cost it is incurring a loss, equally efficient firms are incurring a loss, and more efficient firms (if their average cost is lower than the monopolist's average cost but greater than the price) will also be incurring a loss. Only firms able to withstand losses for as long as the monopolist decides to inflict them will survive, others will perish. If a monopolist is permitted to set a price below its average cost, competition on the basis of efficiency is frustrated, and competition on the basis of wealth replaces it.

Areeda and Turner have opted to place a potent weapon in the hands of the monopolist. Their reasons for doing so should be carefully examined. They have identified four major reasons supporting their position:[66]

(1) it will deter frivolous suits;

(2) a price floor above marginal cost will tend to preserve inefficient rivals;

(3) short-run welfare is maximized by pricing at marginal cost; and

(4) even if long-run welfare is not maximized, long-run consequences are too speculative to incorporate into a legal rule.

The first justification smacks of overkill. Surely it is not necessary to go so far as to allow a monopolist to destroy its competitors in order to protect that monopolist's incentive to

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[65] *CalComp*, *supra* n. 4, at 734. Note that the court in *Murphy Tugboat Co.* v. *Crowley*, 454 F. Supp. 847 (N.D. Cal. 1978), also appeared confused by the cost terminology: " . . . price above full costs, i.e., above the level of average variable costs to which legitimate competition would tend to lower it." *Id.* at 852. Full cost (average cost) is the level to which legitimate competition would tend to lower price. Average variable costs are always lower.

[66] Areeda and Turner, *Williamson on Predatory Pricing*, 87 Yale L.J. 1337, 1339 (1978).

price competitively. A prophylactic rule is required in order to preserve incentives, but sanctioning all price levels above average cost serves this purpose as well.[67]

Areeda and Turner's second reason is interesting, but highly questionable. Apparently, they feel it is the monopolist's function to destroy less efficient competition,[68] and that survival of inefficient firms is undesirable. Even if there is some value in the elimination of competitors who are less efficient than the monopolist, this reasoning overlooks the tendency of a price floor at marginal cost to destroy equally efficient and more efficient rivals unless they have pockets as deep as the monopolist's.

The welfare maximization argument is really the most significant. What is meant is simply that a monopolist with excess capacity, i.e., average cost exceeds marginal cost, will be making more goods available to the consumer at lower prices if allowed to price as low as marginal cost than the monopolist would if forced to utilize less of its capacity by producing less and pricing in excess of average cost. Social resources are wasted because there is a divergence between the cost of the incremental output (marginal cost) and the value of that output to consumers. And, since excess capacity exists, it would be a waste of social resources to attract new entrants who would construct even more facilities.[69]

That short-run welfare maximization argument is shortsighted. While it is true that resources are most efficiently utilized and that consumers benefit when the monopolist prices at marginal cost, such beneficence cannot be expected to continue. Once the competitive threat has been extinguished, the monopolist will return to higher prices and profits. When that happens, society will suffer a greater welfare loss. Fewer goods will be produced, efficient capacity will be idled, and

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[67] Schmalensee, *On the Use of Economic Models in Antitrust: The Realemon Case*, 127 U. Pa. L. Review 994, 1029 (1979) ("Schmalensee").

[68] *See* 3 P. Areeda and D. Turner, *Antitrust Law*, Section 715a, at 165 (1978). Areeda and Turner would also sanction the destruction of equally efficient competition if there is chronic excess capacity.

[69] *See* Areeda and Turner, *supra* n. 38, at 710-11.

consumers will be paying much more than incremental production costs. Professor Scherer recognized that the inclination of monopolies to maximize their profits at the consumers' expense would mean that welfare would be maximized if the monopolist's price reduction was checked at some point above marginal cost. But he was unable to quantify precisely a limitation on price that would maximize long run welfare, i.e., a price rule that would insure that the discounted welfare loss from the anticipated future price gouge would be most offset by the temporary benefits of lower prices.[70] Professor Williamson is also suspicious of Areeda and Turner's approach. In his opinion negligible benefits would flow from temporary price cuts to the marginal cost level, if followed by a return to monopoly pricing.[71]

Areeda and Turner do not argue with Scherer's long-run welfare analysis. They acknowledge that the net long-run consequences of marginal cost pricing might be adverse because of its exclusionary effect, but reject consideration of long-run effects because they are difficult to determine (their fourth reason for adopting a marginal cost standard).[72] Indeed, the welfare maximization problem is complex. In addition to the return to monopoly prices scenario, Scherer described several other cases, some of which would find welfare maximized with price limitations above marginal cost, and some with price limitations below that point.[73] However, ease of application is a poor argument for adopting a rule that admittedly ignores important considerations of economic efficiency, especially when the main justification for that rule is economic efficiency.[74]

In any event, the marginal cost test is not easy to apply either. In fact it is frequently impossible to apply.

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[70] *See* Scherer, *Predatory Pricing and the Sherman Act: A Comment*, 89 Harv. L. Rev. 868, 883-900 (1976) ("Scherer").

[71] Williamson, *supra* n. 52, at 291.

[72] Areeda and Turner, *Scherer on Predatory Pricing: A Reply*, 89 Harv. L. Rev. 891, 896-97 (1976).

[73] Scherer, *supra* n. 70, at 887-89.

[74] *See* Schmalensee, *supra* n. 67, at 903.

It is almost too easy to criticize rule proposals in this area as administratively complex. The initial Areeda and Turner article has engendered much academic discussion and several counter-proposals. It seems that every attempt to formulate rules has been criticized by proponents of other rules as an unworkable solution. Areeda and Turner fare no better. Marginal cost is not a cost recognized by accountants. It is a figment of the economist's imagination. It is not recognized in the books of account, and thus, it is unlikely that any evidence of marginal cost could be easily developed. Areeda and Turner recognized that in their initial article, and suggested average variable cost could be used as a proxy,[75] and that in situations of strained capacity an average cost test could be applied.[76] But they seem to have retreated from that position of late, perhaps as a result of pointed criticism of the logic and feasibility of average cost and average variable cost tests.[77] They now emphasize that theirs is a short-run marginal cost standard, and that the other measures are simply approximations of marginal cost. If plaintiff can show that marginal cost is significantly higher than average cost, or if defendant fails to show that average variable cost is not significantly below marginal cost, then prices in excess of the surrogate standard are not safe under their rule.[78] The burden is always on someone to offer marginal cost evidence, but the data is not there.

Areeda and Turner's justifications are not convincing. They argue that a marginal cost test will optimize social welfare. Then they admit that it will not. They argue that a marginal cost test is easier to apply than a long-run welfare maximizing test, then they suggest surrogates because marginal cost data is impossible to come by. But even if their theory had merit, if all the world's economists were of one voice, and like Areeda and Turner, placed their faith in the monopolist to maximize social welfare by eliminating competitors from crowded industries

[75] Areeda and Turner, *supra* n. 38, at 716-18, 733.

[76] Areeda and Turner, *supra* n. 38, at 709-10, 732-733.

[77] *See* Williamson, *supra* n. 52, at 310-12, 333 n. 122, 337 and n. 129; Scherer, *supra* n. 70, at 869-83.

[78] Areeda and Turner, *Williamson on Predatory Pricing*, 87 Yale L.J. 1337, 1338-39 (1978).

through temporary provision of more and lower priced goods, the Congress and the courts have already placed their faith elsewhere. The goal of welfare maximization through proper resource allocation is to be accomplished by a system of effective competition, not by reliance on the presumed beneficence of a monopolist.[79] In the words of Justice Black, the Sherman Act " . . . rests on the premise that the unrestrained interaction of competitive forces will yield the best allocation of our economic resources, the lowest prices, the highest quality and the greatest material progress . . ."[80] The economic rationale behind the act cannot be overcome by arguments that the monopolist has provided economic benefits.[81]

More than just economic considerations impelled the Congress to adopt competition as the Acts' unequivocal policy. Chief Justice Warren said:

> " . . . We cannot fail to recognize Congress' desire to promote competition through the protection of viable, small, locally owned businesses. Congress appreciated that occasional higher costs and prices might result from the maintenance of fragmented industries and markets. It resolved these competing considerations in favor of decentralization."[82]

Economic considerations aside, justifiable apprehension of excessive economic power concentrations underlie the law's aversion to monopolies.[83]

Areeda and Turner have made a policy judgment. The economic analysis used to justify that judgment is incomplete, and the judgment itself stands contradicted by the economic, political, and social policies of the Sherman Act. A conclusive presumption of the legality of an unprofitable low price, merely because it is above marginal cost, a cost which is all but

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[79] Sullivan, *supra* n. 15, at 20-21.

[80] *Northern Pacific Railway Co.* v. *United States*, 356 U.S. 1, 4 (1958).

[81] *See* Von Kalinowski, *Antitrust Laws and Trade Regulations*, Vol. II, Section 903 [3], p. 954 and cases cited therein.

[82] *Brown Shoe*, *supra* n. 16, at 344.

[83] *Standard Oil of New Jersey* v. *United States*, 221 U.S. 1, 50 (1911); *Berkey*, *supra* n. 5, at 272; *Alcoa*, *supra* n. 44, at 427; *see generally* Pitofsky, *The Political Content of Antitrust*, 127 U. Pa. L. Review, 1051 (1979).

incapable of proof, would truly be a "defendant's paradise."[84] This Court rejects it.

D. *Prices Below Average Cost Are Illegal If They Are Unreasonable.*

There are no simple bright line tests that are universally applicable. Williamson proposes a complex set of "*per-se*" rules, a different rule to be applied depending upon whether the dominant firm is reacting to new entrants or already established firms, whether a short, long or intermediate-run is involved, and whether the demand function is normal or conditions of chronic excess supply are found.[85] Scherer calls for evaluation of the many criteria that would affect long-run welfare maximization, examined in the light of the monopolist's intent and the structural consequences of its pricing behavior.[86]

Professor Schmalensee recently attempted to apply the Williamson rules to the facts of a monopolization case heard before the Federal Trade Commission, but found them imprecise, difficult to apply, and based on an economic model probably at variance with real world conditions and certainly at variance with the facts of the case he discussed.[87] Having already rejected Areeda and Turner's approach as incapable of being "defensibly applied to all, or even most, cases," Schmalensee concluded that Scherer's rule of reason analysis was the only economically defensible policy choice and that an average cost test could be employed to dismiss patently groundless charges of predation.[88]

This approach is not wholly without precedent. In a thoughtful concurring opinion to the case discussed by Schmalensee, Commissioner Pitofsky distinguished Ninth Circuit cases and applied the same rule.[89] The average cost standard adopted here also finds support in several trade rules promul-

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[84] Williamson, *supra* n. 52, at 305.

[85] *Id.* at 331-37.

[86] Scherer, *supra* n. 70, at 890.

[87] Schmalensee, *supra* n. 67, at 1024-28.

[88] *Id.* at 1028-29.

[89] *Borden Inc.*, 1978 Trade Reg. Rep., Case No. 21,490 at 21,517-24 (FTC 1978) (Pitofsky concurring).

gated by the Federal Trade Commission,[90] in state statutes prohibiting below cost sales,[91] in a predatory pricing rule propounded by Professor Posner,[92] in a recommendation by the National Commission for the Review of Antitrust Laws and Procedures that the marginal cost standard be abandoned in favor of a more flexible analytical approach,[93] and finally by the Supreme Court's holding in *Utah Pie Co.* v. *Continental Banking*[94] that a jury could infer price cuts were predatory if price was below average cost.[95]

If the monopolist chooses to price below average cost, something unusual is taking place. A decision has been made to sell goods at a loss, and such activity is worthy of investigation. It may be a predatory act with the design and effect of starving out competitors, or it may in some way be justified.

Prices below average cost would be reasonable if the monopolist was merely liquidating excess, perishable, or obsolete merchandise.[96] Prices below average cost would be warranted if shrinking demand forced the monopolist to minimize its losses by selling at the best price-cost relationship available to it,[97] or where the industry suffers from chronic excess

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[90] *See* e.g., 16 C.F.R. Section 23.20 (Jewelry Industry) and 16 C.R.R. Section 26.9 (refrigeration and/or air conditioning industries).

[91] Arkansas Stats. Title 70, Section 303; California Business and Professional Code, Sections 17026 and 17029; Colorado Revised Code, Section 6-2-105; Hawaii Revised Stats. Title 26, Section 481-3; Kentucky Revised Stats., Section 365.030; Montana Code Ann., Section 30-14-202; Washington Revised Code, Section 19.90.010; Wyoming, official cite unavailable, CCH Trade Reg. Reports, paragraph 35,530.

[92] Posner, *supra* n. 52, at 190.

[93] National Commission for the Review of Antitrust Laws and Procedures, *Report to the President and the Attorney General*, 170-71 (advance text January 22, 1979).

[94] 386 U.S. 685 (1967).

[95] *Id.* at 696-98. Note that this case involved discriminatory pricing under Section 2(a) of the Clayton Act as amended by the Robinson-Patman Act, 49 Stat. 1526, 15 U.S.C. Section 13(a), but that the substantive issues are the same as those when predatory pricing is charged under Section 2 of the Sherman Act, 15 U.S.C. Section 2. *See* 3 P. Areeda and Turner, *Antitrust Law*, Section 720c at 198-90 (1978).

[96] Williamson, *supra* n. 52, at 317-18.

[97] Posner, *supra* n. 52, at 193.

capacity.[98] And the same might be true of promotional pricing, meeting competitors' prices, or even occasional price wars, if carried out under appropriate circumstances.[99] Intent evidence can prove helpful here. The monopolist's own evaluation of the situation, whether it thought it was cutting losses or cutting throats, can help to clarify the nature of the acts undertaken.

A monopolist's prices should be judged according to whether or not they are reasonable, and prices above the monopolist's average cost should be *per se* reasonable. That standard will be applied to the facts of this case.

E. *IBM's Pricing Conduct.*

IBM did not simply reduce the prices of its existing products, instead it responded to PCM competition by introducing several "new" products, all of which were, to some degree, repackaged versions of prior offerings. By offering the new products at lower prices, while maintaining higher prices on the older versions, IBM managed to avoid the disastrous effect an across-the-board price reduction would have had on revenues from installed machines, and yet still had a vehicle with which to challenge the PCMs. It is the prices of these new products that Transamerica claims were predatory.

In 196 IBM introduced a disk drive known as the 2311. In 1965 an improved version, the 2314, was announced. At first, 2314-type disks were only available in a package of eight disks or "spindles" (plus one spindle as a spare). Later, IBM offered a one spindle version (the 2312), a two spindle version (the 2318), and a four spindle version (the 2313), all of which could be connected to the CPU through a control unit (the 2314). The functional characteristics (access time, capacity, and data transfer rate) of all versions were practically identical, and all are known as "2314-type" disks. The PCMs also marketed 2314-type disks. Most PCMs offered some functional improvements (principally a reduced access time), all offered only single spindle versions, and all offered lower prices than IBM.

In September of 1970, IBM announced a new computer system, the System/370, Model 370/145. At the same time, a

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[98] *See Pacific Engineering and Prod. Co. of Nevada* v. *Kerr-McGee Corp.*, 551 F.2d 790 (10th Cir.), *cert. denied*, 434 U.S. 879 (1977).

[99] *Times-Picayune Publishing Co.* v. *United States*, 345 U.S. 594, 623 (1953); *Knuth* v. *Erie-Crawford Dairy Cooperative Association*, 326 F. Supp. 48, 52-53 (W.D. Pa. 1971), *aff'd in pert. part*, 463 F.2d 470 (3rd Cir. 1972).

three-spindle version of the 2314-type disks was announced for use on that new system. This new version was known as the 2319A and was code-named "Mallard." It connected directly to the System/370 Model 145 CPU (and later to the System/370-135) by means of an integrated file adapter ("IFA") which eliminated the need for a control unit. The 2319A was available at a monthly rental of $1,000, a price substantially less than IBM's one, two and four spindle versions (if comparison is made on a per spindle basis, i.e., monthly rental divided by number of spindles), and a price Transamerica claims was predatory.

Three months after the 2319 announcement, in December of 1970, IBM announced a three-spindle version 2314 for use on the older System/360 CPUs. This was known as the 2319B. It attached to the 360 CPU through a control unit (2314B), and a channel. At the same time IBM announced the 2319A2, a second set of three spindles for attachment on the 370/145 CPU behind the first set (the 2319A). The 2319B and the 2319A2 were both priced at $1,000 (monthly rental). Transamerica claims that price was predatory.

In July of 1971, still another three-spindle 2314-type was announced: the 2319A3. Unlike the other versions, the 2319A3 (code named "Zoom") had its own power supply. It was to be used exclusively on the 370/135 CPU, where power constraints had previously limited configurations to a maximum of five spindles. Zoom extended that maximum to eight. Because of the extra power equipment, the 2319A3 was priced at $1050 monthly rental, slightly higher than the other 2319s. Transamerica also claims this price was predatory.

In 1964 and 1965, IBM announced various models of the 2401-type tape drives and 2803 control units. Improved tape drives, the 2320s, were announced in 1968. In November of 1970, IBM announced an improved control unit, the 3803, and three new tape drives to go with it, the 3420 Models 3, 5 and 7. The functional characteristics of the new tapes (data transfer rate, tape speed, and tape density) were practically identical with those of the 2420. The combined tape program was code-named "Aspen." Transamerica claims that the Aspen prices were predatory.

At the same time as the Aspen announcement, November of 1970, IBM announced a new model 2401 tape drive, the 2401 Model 8. Two control units for that model, the 2803 Model 3 and the 2804 Model 3, were also announced. This program was code-named "Mandan." The 2401 Model 8 was almost identical to the seven-track version of the 2401 Model 2, but the price was substantially lower. Transamerica claims that the Mandan prices were predatory.

IBM analyzed the financial aspects of each of these programs (the 2319A, the 2319B/A2, the 2319A3, Aspen, and Mandan) prior to announcement in order to predict the costs, revenues, and profits that could be expected. A common procedure was followed in all pre-announcement financial analyses. The Product Manager, an employee of the engineering division, identified the forecast assumptions. These included a description of the product, competing products, follow-on products, delivery schedules, etc. The forecast assumptions were then used to project the number of units that would be sold and leased at various price levels (the demand function), and from this the program revenue at those prices could be calculated. Direct costs (those that could be readily identified with the product in question) were estimated by the manufacturing division. Indirect costs were assigned to the products through three apportionment methods. By allocating a portion of the indirect costs (such as corporate overhead) to each product, as well as the direct costs, IBM followed a full-cost philosophy of financial analysis and hoped thereby to be able to predict a program's profitability. Full costs, direct plus indirect, were subtracted from revenues, to give predicted program profits.

Each of the product programs at issue here was expected at announcement to return substantial profits to IBM. Zoom (the 2319A3), by far the smallest program, was projected to return a $900,000 profit, or 4.5 percent of revenue; Mandan was expected to produce $29.2 million in profits, or 33.6 percent of revenue; Aspen was projected to bring in $473.3 million in profits, or 26 percent of revenue; the 2319B/A2 program was predicted to bring in a $71.6 million profit, or 31.5 percent of

revenue; and finally, the 2319A was projected to bring in $55.2 million in profits, 31 percent of its revenues. It is only through the application of several "adjustments" to the IBM announcement financial analyses that Transamerica is able to claim that any of the prices at issue here were below average cost. Each of the adjustments Transamerica suggested is discussed below.

1. ***The Revenue Apportionment Adjustment.***

As mentioned above, IBM uses three apportionment techniques for determining what indirect costs a particular product or program should bear. The indirect costs that are most closely associated with engineering are apportioned among products according to the relationship between that product's direct engineering costs, and total direct engineering cost. Similarly, indirect costs that are associated with production are allocated to the ratio between the product's direct production costs and total direct production costs. Finally, indirect costs that are not otherwise apportionable, such as marketing, general and administrative expenses, are apportioned to products according to the relationship between that product's revenues and total revenues.

IBM allocates over 50 percent of a product's costs through the revenue apportionment method. Transamerica complains that this method provides a monopolist with too much flexibility. They say that where a price cut is involved it permits the monopolist to drastically reduce price and still not be pricing below cost because reduction in price means a reduction in revenue and thus a reduction in revenue-apportioned costs. When revenue is reduced on one product, some of the costs previously associated with it are automatically transferred to other products. Transamerica characterizes all the products at issue here as disguised price cuts: The 2319s as disguised price cut versions of the 2314; Mandan as a disguised price cut on 2401 Model 2; and Aspen as a disguised price cut on the 2420.

Through its expert accountant Peterson, Transamerica invokes "generally accepted cost accounting principles," and adjusts the revenue-apportioned costs assigned to each of the products at issue. Assuming that he was in fact dealing with price cuts, Peterson increased each new program's revenue-

apportioned costs by multiplying the costs assigned at its announcement by the ratio between the "old" price and the lower "new" price.

The basis for Mr. Peterson's adjustment is suspect. The phrase "generally accepted cost accounting principles" does not appear in accounting literature. It, like the adjustment it supposedly requires, appears to have been invented for purposes of this lawsuit.

The adjustment is predicated on the existence of a price cut when, at least in some circumstances, different products are clearly involved. And, it assumes that the cost allocated to the product at the old price was somehow "correct" and should be maintained, when in fact it is precisely the inability to associate these expenses with any particular product that makes an apportionment method necessary. It would be equally logical (or illogical) to assume the previously assigned costs were too large and the new ones are "correct."

Revenue apportionment is a generally accepted and commonly used method of indirect cost allocation. IBM used it consistently long before making the cost analyses at issue here. Peterson's adjustment would abandon that consistency, and with it any assurance that full costs are recovered. Increasing the costs assigned to one product without somehow decreasing the costs that other products must bear would lead to an over-recovery of costs, and make the full-cost recovery rationale and program profit predictions meaningless.

All methods of indirect cost recovery are arbitrary and flawed in some respects. The flexibility of revenue apportionment is apparent, yet this Court will not attempt to "correct" that characteristic by mandating the use of a patch work system based on one accountant's views of the facts of this particular case. To do so would not only be bad accounting, it would be bad law. Businessmen would have no notice of what was required to be done if arbitrary adjustments were allowed to be applied after the fact to their reasonable and consistent cost accounting.

This is not to suggest that under other circumstances cost accounting adjustments might not be warranted. Where a defendant itself abandons consistency in attempts to circumvent the law, adjustments might be appropriate. That, however, is not the case here. The revenue apportionment adjustment is rejected.

2. ***The Manufacturing Cost Adjustments.***

All the 2319 programs were reuse programs. For instance, 80 percent of the 2319As were not newly built, but were built by reconditioning and slightly altering used 2313s that had come off rent. Mandan was a total reuse program; all the units involved were reused, off rent, tape drives and control units. In the announcement financial analyses for these products, IBM assigned a full manufacturing cost to those units that were to be newly built, but the reused units were costed at the cost of conversion efforts plus their remaining undepreciated net book value. Since IBM uses an accelerated depreciation technique (sum of the years' digits), and since the 2313s had already been depreciated for three years (of a total four year depreciation life), the net book value used to represent the manufacturing cost of the 2319s was only 10 percent of the cost of building them new. With Mandan, the reused units were even older, and, since their net book value was insignificant, the only manufacturing cost reflected was the minor expense involved in reworking the units.

Peterson testified that this was in conflict with the "benefit principle," which he termed the single most important "generally accepted cost accounting principle." He suggested two alternative adjustments. The first would simply account for all machines at the cost of building them new, whether that was in fact done or whether they were "retreads." The second, more complex, adjustment would require the reworked product's cost accounting to bear a manufacturing cost equal to the new cost multiplied by the ratio between the expected rental life of the new product and the total lives of the old and the new products. In effect, the second adjustment would be the same as using net book value, had IBM depreciated over the total life of both products using a straight-line method.

IBM's Financial Procedures Manual calls for using new cost in some situations, scrap value in others, and permits net book value to be used in yet other cases. IBM argues that the manual would have permitted the use of scrap value and so their use of net book value was conservative. Transamerica interprets the manual differently, claiming it mandates the use of new cost. Mr. Peterson contradicted that. He testified that IBM complied with the manual in its handling of reused products. This Court agrees with Mr. Peterson, and finds that IBM followed its cost accounting procedures consistently. Until some cost accounting principles become generally accepted (and others generally rejected), it seems that a reasonable procedure, consistently followed, should not be vulnerable to subsequent manipulations. IBM's depreciation method is reasonable and generally accepted. The cost account for the original product reflected its full cost, and use of net book value is a reasonable means of apportioning some of the cost to the new product. Deviations from consistent procedures in this area would cause the same inconsistencies as would be created by the revenue apportionment adjustment. Accordingly, this Court rejects the manufacturing cost adjustments.

3. ***Shorter Rental Lives.***

The programs at issue here were predominantly leasing programs. Few units were expected to be sold. Consequently, the length of time forecasters predict units to be producing rental revenues, the average rental life, is a critical factor in determining a program's profit. IBM predicted a 48 month life for the 2319A, 50 months for the 2319B/A2, and 58 months for Mandan. No witness ever opined that IBM should have chosen shorter lives, but Peterson produced alternative profit calculations based upon much shorter (and therefore less profitable) lives for these products. The apparent inference was that the lives chosen at announcement were unreasonably long, and that the shorter lives should have been substituted.

This Court refuses to make that inference. Although the alternative lives presented were found in IBM documents, Transamerica has invariably chosen the shortest lives reflected

in any IBM document while ignoring longer lives for other products in the same document, and ignoring longer lives for the same product in other documents. The shorter lives all appear in documents dated well after announcement and can be explained in part by the intervention of unexpected increased PCM successes, in part by the intervening funding of impacting IBM programs, and in part by the unreliable nature of the documents themselves, at least as far as the reliability of the lives contained therein is concerned. There is no evidence that anyone in IBM contemplated shorter lives at any time prior to the announcement dates. One of Transamerica's witnesses, a man experienced in the financial aspects of computer leasing, testified that he thought the most reliable estimate of life would be that made by IBM, and that he didn't know how he could go back in hindsight and assign a different life. Absent some evidence that shorter lives were, in fact, required, this Court must decline to substitute shorter rental lives.

4. ***Cost of Capital Adjustment.***

As already indicated, this Court would consider prices to be *per-se* reasonable only if they exceeded average cost, where average cost is defined to include a reasonable return on capital invested. If a company is thinly capitalized, most of these capital costs will be reflected as interest on the books of account. Conversely, if a company depends upon equity capital to fund its programs, no interest expense will appear, and the opportunity cost of the capital invested in the program will have to be estimated and imputed. Unless all capital costs are in some way included in the cost-price equations, a *per-se* sanctioning of price in excess of average cost would favor strong firms, able to use equity capital over weaker firms depending on borrowings.

Estimating capital cost is not an impossible task. It requires some estimate of the amount of capital invested in a program and of the duration of that investment, and some basis for finding a "normal" rate of return on such an investment. Transamerica proved none of these. No evidence of invested capital has been introduced and no witness has ventured an opinion as to what the cost of capital ascribable to any program

might be. Reliance instead is placed on a "Program Evaluation Technique" ("PET"), a method of estimating cost of capital described in IBM's Financial Procedures Manual.

Transamerica first revealed it was relying on PET to indicate IBM's program revenues were insufficient to cover its cost of capital during counsel's closing argument. As a result, no witness has had an opportunity to be examined or cross-examined as to the propriety of such an approach. Some flaws are apparent, however.

The method applied by Transamerica is the least sophisticated of several PET options. It employs a matrix with which one can determine a current value of profits (as a percent of revenue) if one knows the rental life of the program, and the program's expected (undiscounted) profits percentage. For instance, if a program with a 36 month rental life were expected to yield a 20 percent profit, then the matrix would indicate that when discounted to present value the profit returned would be only 8.8 percent. The PET explanation describes the cost of capital as a cutoff rate established by management, and sets that rate at 7 percent. Assuming that a 7 percent return is a normal return, then the hypothetical program's profits exceed the cost of capital invested (8.8 percent exceeds 7 percent).

But there is a caveat that concludes the description of the PET matrix which warns against its use if the program being analyzed deviates from the pattern the matrix developers assumed was typical. Clearly they have made some assumptions as to the level of investment, and the annualized cash flow of the program. There was no showing here as to what those assumptions were, or that the investments in any of the programs at issue are similar. Moreover, even if that evidentiary gap could be bridged, the matrix shows that programs with profits in excess of 25 percent more than cover capital costs at all rental lives. The programs at issue here, once the specious adjustments rejected above are ignored, were all expected to

earn profits in excess of 25 percent and thus in excess of capital costs.[100]

Transamerica's cost of capital adjustment suffers from a failure of proof. It was plaintiff's burden to establish this element of its case. This Court will not attempt to estimate that which plaintiff has failed to quantify.

5. ***FTP Adjustment.***

FTP (Fixed Term Plan) was a long-term lease plan offered by IBM on peripheral equipment. FTP was announced in May of 1971. Prior to that time customers could either buy peripheral equipment, or lease it on a month to month basis. With FTP, IBM offered customers a one year lease at an 8 percent discount from the monthly rental price, or a two year lease at a 16 percent discount. Transamerica offered no evidence that FTP caused a decrease in the profits of any product. Indeed, all the evidence indicates that IBM projected that FTP would increase revenues and profits over the levels expected if FTP were not announced.

Transamerica's argument for an FTP adjustment to the profits of the programs at issue here, did not surface until after the close of evidence. They compare an IBM projection of program profits at one time (before and without application of FTP) with another and later profit projection which included the application of FTP. They conclude from the comparison that FTP caused revenues and profits to decline, and seek to apply the computed decline pro-rata to the revenues and profits of the products in issue. This method is unacceptable. It fails to give effect to other circumstances which changed between the two projections, and, more importantly, it ignores the fact that the second projection, specifically designed to compute the effect of FTP under the circumstances existing at that time, showed that FTP could be expected to increase both revenues and profits. Unrelated forecasts cannot be so manipulated.

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[100] The only exception to this was the 2319A3. It should be emphasized that this Court does not accept the PET matrix as proof of capital costs, but even if it had, it would find the price of the 2319A3 reasonable, and not to have damaged Transamerica in any way. The 2319A3 was a specialized program, a disk drive with a power supply, and there is no evidence that Transamerica or any other competitor even considered supplying the very limited market this product addressed.

FTP undoubtedly created a new price-cost relationship, one not reflected in the announcement financial analyses, and one probably unanticipated at that time. But there is evidence to indicate that FTP reduced costs and increased revenues; there is no convincing evidence to the contrary. Accordingly, this Court refuses to decrease projected profits as a result of FTP.

6. ***Additional Evidence That Prices Were Reasonable.***

This Court has concluded that the IBM announcement financial forecasts for the 2319s, Aspen and Mandan were reasonable, and that IBM reasonably anticipated that those prices, even after FTP discounts were applied, would exceed average costs.[101] Although profit expectations at the product's introduction may be the primary consideration in analyzing a firm's pricing behavior,[102] evidence of actual profitability is also relevant.

IBM's financial analyses are updated at various times after a product's announcement. These updates reflect the realities of marketplace experience with the product, and thus more accurately reflect its profit picture. Financial analyses of the 2319A and 2319B done one year after announcement showed those products to be expected to produce profits (as a percent of revenue) of 40.2 percent and 34.5 respectively. One year after announcement, Mandan was expected to bring in 25.8 percent in profits, and Aspen 17.4 percent. A little over a year after that, Aspen's profits had improved to 20.5 percent. A financial analysis of all the 2319s combined and updated through 1978 indicated that the combined programs yielded 28.4 percent in profits. This evidence confirms the findings that IBM reasonably expected substantial profits on all the peripherals at issue; that the prices (including FTP) were above cost, and reasonable; and that the prices were legal.

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[101] This conclusion is reinforced by the fact that IBM included estimates of cost contingencies, allowances for unexpected cost increases, in its announcement financial analyses that ranged from 5.2 percent of expected revenue (for the 2319B) to 7.8 percent (for Aspen). This Court would be inclined to diminish defendant's costs by the amounts included as contingencies if the price-cost relationship were a closer question.

[102] *CalComp, supra* n. 4, at 740 n. 19.

Even if those prices had been slightly below cost, and their reasonableness thus open to inquiry, this Court would not hesitate to find them reasonable. The 2319s and Mandan were programs which reused third generation equipment at a time when fourth computer generation had already been announced. That older equipment was soon to become obsolete, and it is reasonable for a manufacturer in such circumstances to reduce price and squeeze as much revenue as possible from equipment before demand dwindles.

Reasonableness is also indicated by comparisons between the PCMs' prices and IBM's. Such comparisons indicate that IBM's prices did not undercut the PCMs' prices, they did not even equal them, they merely closed the gap; the PCMs' prices were still lower.

Shortly after the announcement of FTP, IBM announced price increases on some of its CPUs. Transamerica suggests that this was done to offset profits lost on peripherals as a result of FTP, and was a use of monopoly power in one market to gain a competitive advantage in another. The evidence indicates otherwise. First, FTP was expected to increase long term profits. Second, if a competitive advantage is gained by lowering price to a level in excess of average cost, the competitive advantage is efficiency related, not monopoly related, and equally efficient competitors will continue to make at least a normal profit. If the monopolist foregoes some excessive profits but still prices above average cost, it is immaterial how, or whether, the foregone profits are recouped. Conversely, if price is set below average cost, recouping losses by monopoly pricing in another market would be a strong indication that the lowered price was unreasonable. The critical issue is whether price exceeded average cost. If, as here, it did, the price is reasonable, will eliminate only the less efficient, and does not violate the antitrust laws.

This Court finds that all the prices at issue here exceeded average cost, were reasonable, and legal.

V.

DESIGN CONDUCT

It is not difficult to imagine situations where a monopolist could utilize the design of its own product to maintain market control or to gain a competitive advantage. For instance, the PCMs were only able to offer IBM's customers an alternative because they had duplicated the interface, the electrical connection between the IBM System/360 CPU and the IBM peripheral (or peripheral subsystem). Had IBM responded to the PCMs' inroads on its assumed monopoly by changing the System/360 interfaces with such frequency that PCMs would have been unable to attach and unable to economically adapt their peripherals to the ever-changing interface designs, and, if these interface changes had no purpose and effect other than the preclusion of PCM competition, this Court would not hesitate to find that such conduct was predatory. Or, if a monopolist frequently changed the teleprocessing interface by which its computers communicate with remote terminals in such a way that its terminals would continue to function while others would fail, and, if the only purpose and effect of the change was to gain a competitive advantage in the terminal market (where the monopolist lacked monopoly power), that use of monopoly power would be condemned.

It is more difficult to formulate a legal standard for design conduct than it is to imagine clearly illegal situations. Any such standard must properly balance a concern for the preservation of desirable incentives with the need to prevent monopolization by technology. Like pricing, equipment design can have procompetitive as well as anticompetitive aspects. Truly new and innovative products are to be encouraged, and are an important part of the competitive process. For this reason, the acquisition or maintenance of monopoly power as a result of a superior product does not violate the Sherman Act. One court has even suggested that where there is a valid engineering dispute over a product's superiority the inquiry should end; the product is innovative and the design is legal.[103] That view, probably the

[103] *ILC Peripherals* v. *International Business Machines*, 458 F. Supp. 423, 439 (N.D. Cal. 1978).

result of a concern for the creativity that has characterized the history of computers, is overprotective. It ignores the possibility that a superior product might be used as a vehicle for tying sales of other products, and would pronounce products superior even where the predominant evidence indicated they were not.

Another approach would be to examine the designers' intent. If a technological design were chosen for an illegal purpose (such as to effectuate a tie) and if that purpose was fulfilled, it would be illegal.[104] If that standard were to apply only where the intent was solely an illegal one, creativity would not be stifled. But usually many results are intended, and if only one, even the predominating, intent is illegal, and thus punished, legitimate incentives will be imperiled. Discerning corporate intent is seldom easy, and, in any event, the law against monpolization is much more concerned with the effect of conduct rather than with its purpose.

A more generalized standard, one applicable to all types of otherwise legal conduct by a monopolist, and one recently adopted by the Ninth Circuit, must be applied to the technological design activity at issue here. If the design choice is unreasonably restrictive of competition, the monopolist's conduct violates the Sherman Act.[105] This standard will allow the factfinder to consider the effects of the design on competitors; the effects of the design on consumers; the degree to which the design was the product of desirable technological creativity; and the monopolist's intent, since a contemporaneous evaluation by the actor should be helpful to the factfinder in determining the effects of a technological change.

A. *Interface Changes.*

The PCMs were engaged primarily in replacing only peripherals attached to IBM systems. To the extent that IBM could prevent (or make inordinately expensive) the physical

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[104] *See Response of Carolina, Inc.* v. *Leasco Response, Inc.*, 537 F.2d 1307, 1330 (5th Cir. 1976).

[105] *Sherman* v. *British Leyland Motors, Ltd.*, 601 F.2d 429, at 452 n. 46 (9th Cir. 1979); *CalComp, supra* n. 4, at 734; *Gough* v. *Rossmoor Corp.*, 487 F.2d 373, 376 (9th Cir. 1973).

attachment of such gear, it had the power to eliminate competition. Transamerica complains that this was what was done by interface changes made when the new products at issue here were designed.

The interface between the Aspen tape drives (3420 Models 3, 5 and 7) and the Aspen control unit (3803) differed significantly from the interface utilized by the immediate predecessor tapes (2420s) and control units (2803s). PCMs wishing to attach their 2420 copies to the new and improved control unit were effectively precluded from doing so. The cost of adapting a 2420 to the new interface format were prohibitive. Transamerica charges that the interface change was unnecessary, and that its only purpose and effect was to preclude PCM competition for tapes attachable to the 3803.

The evidence is to the contrary. Not only was the 3803 a superior product (as Transamerica concedes), the interface itself was a superior product. It had fewer wires and connectors. This meant switching between tapes and control units could be done more simply (fewer switch points), enabling IBM to integrate the switching mechanism into the control unit and thereby eliminate the need for a costly and bulky separate switching device. The pulses on the wires were multiplexed. That meant more sense information could be transmitted and diagnostics and maintenance were improved. Signals were converted from analog to digital at the tape head (rather than in the control unit), meaning information could be transmitted more reliably (with less noise interference). And, tape drives were attached to the 3803 radially (rather than serially), making maintenance and computer room layout easier. All of these changes required interface changes, and all were undeniably improvements.

Transamerica (which never owned any 2420s anyway) will not be heard to complain that it was somehow injured by an improved product. The Aspen interface was just that. It was adopted by IBM because it was a product improvement, and even if its effect was to injure competitors, the antitrust laws do not contemplate relief in such situations.

The Mandan interface was also changed. It was different from the interface between the predecessor 2401 Model 2 tape drive and its control unit, the 2803 Model 1. But this interface change was truly minimal. Five wires were added, and two wires were removed. The evidence was uncontradicted that: the change was purposeful, to identify the model to the control unit; the change was ordinary, all 2401 models were so identified; and the impact on PCMs was insignificant, the technical information was made public and with it a qualified engineer could adapt a 2401 Model 2 interface in one hour. There was no evidence that any PCMs wished to hook into the Mandan control unit, but had they so desired, this interface change would certainly not have precluded it.

A more complex problem is presented by the interface between the 2319A and the IFA. The IFA represented a different mode of peripheral attachment than had been utilized on most System/360 CPUs. Instead of a CPU to channel to control unit to peripheral attachment, the IFA resided in the CPU itself and attached directly to the peripheral device. That eliminated the need for control units and channels, saving the user space and money. The IFA, unquestionably a superior product, was an optional feature for sale or lease on the 145 and 135 System/370 CPUs.

From approximately 1969 until mid-1970, IBM's Endicott laboratory, responsible for the design of the 145, planned to design the IFA so that IBM 2314-type disks would attach with minor modifications. This was known as the Apricot plan. IBM's Hursley laboratory in England, responsible for the development of the 135, the sister to the 145 CPU, opposed this plan and, as early as 1968, and again in 1969, had proposed specifications for disk drives that were ultimately adopted by IBM in the summer of 1970 and announced as the 2319, code named Mallard. Under Apricot, a user could have attached IBM 2312s (one spindle), IBM 2318s (two spindles), or IBM 2313s (four spindles) in any combination. IBM 2314-type spindles would attach because the planned Apricot interface duplicated the interface between the 2314 control unit and the drives. PCM 2314-type drives would not have attached without modification to the Apricot IFA, but because the 2314 interface

was well known, the PCMs could have quickly and easily duplicated that interface and made their drives available for attachment to the IFA. Primarily because of this exposure to PCM competition, IBM dropped Apricot and adopted the Mallard (2319A) plan.

With Mallard, one of the spindles was removed from the frame of a 2313. Into that vacant space IBM moved some of the control electronics that would have resided in the CPU under Apricot. The result was that the interface into the IFA was different under Mallard than under Apricot. And because it was different, and unknown to the PCMs, their efforts at copying the interface had to be delayed until they could examine the device IBM had produced.

With Mallard IBM bought itself some time. The interface change meant that PCM copies would not be available as quickly as if a known interface had been used. In a lease oriented market, where product obsolescence limits rental lives, time is money. If the PCMs could be sufficiently delayed, their market might even be limited to the point that the expense and trouble of duplicating the 2319A interface would no longer be worth it.

IBM's predominant intent in adopting the Mallard design was undoubtedly to preclude or delay PCM competition and gain a competitive advantage. However, other considerations also played a role. Mallard alleviated some difficult technical problems. It saved some space in the space-critical 135 CPU; it resulted in the location of a diagnostic device (the CE panel) near the drives where it was easier to use; it reduced cable lengths and electrical noise interference problems; and its simplified engineering control and record keeping for IBM by assuring that the engineers and the laboratories that were most familiar with the disk-related electronics would be responsible for them. On this record, the Mallard concept was a superior design.

Mallard's effect should also be considered. It appears the market segment affected by the 2319A was not something that held a great attraction for PCMs. The 2319A was expected to be an interim disk file for the 135 and the 145. Once IBM's

3330 became available, 2314-type devices would no longer be very attractive because the 3330's offered better performance at lower price. And during that interim, PCMs had their hands full supplying System/360 users with 2314-type disk drives and control units. These subsystems were more profitable for the PCMs (and therefore more attractive) than supplying only disk drives for attachment to the once-contemplated Apricot would have been. For instance, Telex had a backlog of orders for 2314-type subsystems that lasted until November of 1973, and thus, had little capacity or motivation to copy either the Apricot or Mallard interface in order to supply the less profitable drives. And, in any event, PCMs were not effectively precluded from competing for disk placements on the 135 and 145. Selector channels were available on the machines, and PCM subsystems attached without modification to those channels.

Mallard was a design adopted primarily to preclude PCM competition, but it was a superior design, and its effect on competition was negligible. A finding adverse to IBM on this aspect of its conduct would amount to a punishment for intent alone. This Court concludes that Mallard interface did not unreasonably restrict competition, and did not violate the Sherman Act.

B. ***Price Differences Justified by Design Changes.***

Transamerica alleges that the Aspen and Mandan tapes, and the 2319s were in reality simply repackaged old devices, that the design changes that differentiated them from their predecessors were meaningless except insofar as they permitted IBM to continue to enjoy monopoly profits on its on-lease older equipment while meeting PCM competition with lower priced "new" machines. This price discrimination between users is, they say, entry barrier raising conduct on the type condemned in *United Shoe*.[106]

The premise for this argument, the identity of products, is inapplicable to the Aspen tape drives. The Aspen 3420s were partly built from parts salvaged from 2420s, but over half of the 3420 parts were new. Conversion of a 2420 drive to the 3420

[106] *Supra* n. 13.

drive was impossible. And the changes made resulted in an improved product. Newer technology was used for the circuitry. A data format not available on the 2420 could be used on the 3420 (NRZI). And changes were made to enhance the reliability, availability and serviceability of the newer tapes. The Aspen tapes were different and better products than the 2420s, available to all customers, not price discrimination.

The differences between the 2314s and the 2319s were not as great. The functional characteristics (including reliability, availability, and serviceability) were identical. Packaging was different. The 2319s came only in three-spindle versions; prior to the 2319 announcements, no 2314s were available in three-spindle packages. Even if that is insufficient to conclude that different products are involved, the manner in which the 2319s were marketed refutes any allegations that they represented price discrimination. The 2319As were widely publicized and available to all customers whether or not PCM competition threatened. The same is true with the 2319Bs. Within one year of the announcement, IBM had placed over 20,000 2319B spindles, more than they predicted they would place. Users knew that the 2319B was a 2314-type device with a lower per-spindle price, and they chose it in great numbers. No price discrimination was involved with the 2319s.

The 2319B price discrimination claim surfaced early in the trial, and IBM convincingly refuted it. Mandan was different. Both parties essentially ignored the alleged price discrimination aspect of Mandan. That was probably because Mandan was a relatively insignificant program; only 550 Mandan units were ever sold by IBM.

The Mandan 2401 Model 2 was a slow (75 inches per second) tape drive introduced by IBM in 1964. By 1970 IBM had a warehouse full of these older drives and 2803 controllers. To make them more competitive, IBM made the minimal interface changes already described, changed the name plates, and offered a seven-track only. Mandan subsystem (the 2401 Model 2 came in either seven or nine-track versions) at reduced prices. There is some evidence that IBM did not put its greatest marketing efforts into the Mandan program. But to conclude it

was discriminatorily priced would require an inference from its poor market reception that it was only offered to customers if PCM competition threatened. That is an inference this Court will not make on the skimpy record before it. And, in any event, this Court previously endorsed a conclusive presumption that price manipulations resulting in prices greater than average cost were legal. Mandan's prices were above average cost and would have eliminated only less efficient competitors. Mandan did not unreasonably restrict competition, and did not violate the Sherman Act.

C. *Design Changes on the System/370 Models 115 and 125.*

The 115 and 125 were the smallest of IBM's fourth generation System/370 CPUs. Initially it was planned that an improved product, the 3340 disk drive, would attach natively to these machines through an IFA-type device. When it became apparent that the 3340 would not be ready at the time of the announcement of the 115 and 125, IBM planned to natively attach third generation disk drives (2314 types) as an interim disk solution. That plan did not last long. IBM realized that permitting third generation IBM equipment also meant permitting third generation PCM equipment, and that once users had third generation disk equipment installed, they would resist efforts to persuade them to migrate to IBM's fourth generation disks. The plans to natively attach third generation disk equipment on these machines were dropped in favor of fourth generation equipment.

Transamerica claims the failure to introduce a new CPU with native attachment capabilities for old disk equipment violates the Sherman Act. There is no doubt that the 115 and the 125 were superior products. Nor is there any doubt that the disks ultimately selected were superior products. Their data rates, access times, and capacity exceeded the performance available in third generation disks. This performance improvement was critical if the machines were to operate efficiently in a virtual mode, and a virtual operating system later became standard on both the 115 and the 125. Even if, as Transamerica suggests, the switch to newer and better disks was done to

impact competition and occasioned some delay in the program, this Court would find that the introduction of an improved CPU with a superior disk natively attached did not violate the law.[107]

At one time, the 115/125 plans called for a selector channel to be made available on these machines. A selector channel would have permitted attachment of all the higher speed devices that were attachable to selector channels on the older System/360 CPUs. But that meant IBM would be exposed to PCM competition from channel attached third generation tapes and disks, while trying to sell the natively attached fourth generation equipment. Primarily to preclude this competitive threat, IBM investigated the possibility of dropping the plans for a selector channel.

At that point it was determined that the selector channel had become superfluous. A different plan had already emerged to attach IBM's System 7 process control computers, and the IBM disks and tapes that would have attached to the selector, could be natively attached instead. The number of potential users of these systems that were already using systems with channel attached peripherals was insignificant. By far the greatest number of "migrator systems" were ones that did not have selector channels or peripherals that would attach to selectors. In short, IBM had no further need for the selector; its only function would have been to provide a means of PCM attachment. Eliminating it saved IBM time and development expense. The selector channel elimination did not unreasonably restrict competition.

The 115 and 125 also included a byte multiplexor channel for attaching slower speed devices. A byte multiplexor channel can operate in either byte mode or burst mode. If a multiplexor can operate in burst mode at the same speed at which a tape or disk peripheral can operate, it is possible to attach some relatively slow devices to it.

The byte multiplexor on the 115 and the 125 was initially planned to be able to transfer data at a rate of 50,000 characters per second (50KB). That would have permitted

[107] *Cf. Berkey*, *supra* n. 5, at 282.

attachment of PCM copies of IBM's 2401 Model 1 and 2415 Model 6 tape drives which operated at 30,000 characters per second (30KB). When the head of the IBM's Computer Division called upon the engineer in charge of the 115 and 125 project to investigate the possibility of removing the selector channel, he also inquired about removing the multiplexor. The engineer's response was that while selector channel removal was feasible, multiplexor channel removal was not, but he would like "to investigate further the possibility of reducing the speed of the multiplexor channel and eliminating the possibility of attaching higher speed devices, e.g., 30KB magnetic tape."

When they were announced, the byte multiplexor on the 115 and the 125 were capable of operating at 29 thousand characters per second (29KB), just short of the speed that would have enabled the PCMs to attach. IBM's explanation is that an engineering problem caused by virtual storage operation caused the degradation. But there is no contemporaneous evidence of any such problem.

IBM degraded system performance, making its product less attractive to users. The only purpose served and the only effect of the degradation was the preclusion of competition. The law tolerates the perpetuation of a monopoly only where necessary to preserve competitive incentives and to avoid being unfair to the innocent monopolist.[108] The law need not tolerate deliberate acts where the only purpose and effect is to use monopoly power to gain a competitive advantage. Slowing down the multiplexor on the 115 and 125 was unreasonably restrictive of competition and would have violated Section 2 of the Sherman Act if IBM had monopoly power.[109]

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[108] *Id.* at 78,004.

[109] It should be noted here that any finding this Court might make that the multiplexor degradation violated the Sherman Act would be accompanied by a finding that Transamerica suffered no injury as a result of that conduct. The market for the tapes excluded by this conduct was insignificant. Only tape drives with data rates between 30 and 50KB were affected. Those were older, low performance technology devices that would only have been competitive at prices far below those contemplated in Transamerica's damage claim. Transamerica probably owned some of them, but its President didn't know how many, and any Transamerica owned were purchased in the second

(Footnote continued on following page)

VI.

OTHER CONDUCT

One aspect of IBM's long-term lease plan, the pricing aspect, has already been discussed. Transamerica claims that even if the resultant price were not predatory, FTP was exclusionary and violated the Sherman Act. The basic argument, relying on *United Shoe*,[110] is that entry barriers are artificially raised when a monopolist leases its product for long terms; would-be competitors are unable to woo customers away from the monopolist because the lease provisions lock them out. United Shoe's leasing practices violated the Sherman Act even though they conformed to long-standing traditions in the shoe machinery business and were similar to leases employed by competitors.

IBM recognized the potential lock-out effect of FTP. They knew that if customers would opt for the longer leases on their peripheral devices, PCMs would be kept at bay long enough for IBM to complete its development and introduction of improved products. The improved products would also be leased for long terms, and PCM copies of the improvements would also be locked out. But an awareness of the truism that one's own successes in the market will mean losses for others is insufficient in itself to make an activity unreasonably restrictive of competition and illegal.

IBM's competitors all offered long term leases on their equipment. Leasing companies offered terms of two to nine years. Systems competitors offered three to six year terms, and PCMs offered terms of up to five years. Most PCM equipment was leased for one year terms, very few leases were shorter.

(Footnote continued from preceding page)

Telex tape contract. Because that contract was not an arms-length transaction, this Court would be reluctant to award Transamerica any damages on the equipment purchased thereunder. Also, there is no evidence that Transamerica in the past supplied peripherals for the 115/125 migrator systems, or that it intended to, or took any steps to supply peripherals for the 115 and 125 systems.

[110] *Supra* n. 13.

Despite the product introductions late in 1970, (2319s, Aspen, Mandan) IBM continued to lose business to the PCMs at an alarming rate. The lack of a long-term lease in IBM's marketing portfolio was a principal reason.

And customers brought that to IBM's attention. In April of 1971 the Comptroller General of the United States (IBM's largest customer) issued a report directing that acquisition of the computer equipment be made on multi-year leases to the extent practical. IBM was the only major computer equipment supplier that did not offer a long-term lease alternative.

An economic recession forced customers to cut back on investment in computer equipment. IBM's peripherals, mostly on 30-day leases, were more vulnerable to the belt-tightening than PCM gear on longer contracts at cheaper prices. PCMs reacted to IBM's 1970 announcements by slashing their own prices and offering special concessions not available from IBM. As a result, IBM was losing ground in a growth market, suffering negative net placements while the PCM installation rate continued to climb.

Against this background IBM adopted FTP. It gave the customer one and two-year lease options at an 8 percent and 16 percent discount respectively. Premature cancellation by the customer would lead to a penalty payment equivalent to two and a half months rent on the one-year lease and five months rent on the two year version. No penalty was incurred if the customer canceled prior to machine installation. FTP applied to most tape drives, disk drives and printers.

It was a manifestly reasonable reaction to competition. The lock-in effect was limited. After thirteen months, the two year customer could break the lease, pay the penalty and still be in the same position financially as if a month-to-month lease had been chosen. The one year customer's breakeven point came after nine months. Many PCMs did not offer such liquidated damages provisions; the defaulting customer would be liable for the total rent for the remaining contract term. And the lock-in did not effectively lockout. The PCMs enjoyed healthy increases in tape and disk placements and revenues from 1968

until 1975. PCMs' copies of the 3330 and the 3520, the equipment supposedly locked out to the greatest extent, were by far their best sellers. By 1976 PCMs had placed more of these devices than all of their older technology combined.

The situation before the court in *United Shoe*[111] was different. United Shoe did not sell its machines (as IBM does) or make them available on 30-day leases (as IBM does); it only rented them and only for ten-year periods. The court refused to decree that United Shoe be required to abolish long term leasing altogether, five-year leases were permitted, in part because abolishing long term leasing would have disabled United Shoe's ability to compete.[112] The same consideration applies here. If FTP's one and two-year leases are condemned, that would severely handicap IBM's ability to compete in a market where buyers prefer long-term leases. FTP did not reasonably restrict competition, and did not violate the Sherman Act.

Extended Term Plan ("ETP") was a similar long-term lease plan announced on March 1, 1972. Transamerica introduced very little evidence on ETP, and failed to show it was unprofitable or unreasonably restricted competition. ETP did not violate the Sherman Act.

Transamerica also complains that the System/360, and several time-sharing and scientific 360 models, were announced prematurely and at predatory prices. Evidence of these 1964 and 1965 announcements was admitted to permit the finder of fact to understand the history of the computer industry and to evaluate other conduct against that background. No evidence has been offered from which an inference could be drawn that these acts in any way injured Transamerica. All these announcements were made years before Transamerica was incorporated, and if anyone was negatively affected, it was systems competitors, not the PCMs or their financiers. Whether phrased in terms of causation or standing to sue,[113] Trans-

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[111] *Id.*

[112] *Id.* at 349, 352.

[113] *See CalComp, supra* n. 4, at 734, holding that plaintiff there, a PCM, lacked standing to sue on this same conduct.

america's contentions that IBM somehow violated the law with these announcements are immaterial to any cause of action for which it can hope to recover damages, and they will receive no further attention here. Likewise, no attention is required to Transamerica's contentions that IBM excluded competition by increasing System/370 purchase multipliers and by eliminating its so-called technological discount for the purchase of leased equipment. Transamerica makes no claim for relief based on these acts, and introduced no evidence supporting an inference that the events adversely affected its business.

VII.

ATTEMPT LIABILITY

In the preceding three sections IBM's conduct was analyzed under the assumption that IBM was in possession of monopoly power. The pricing, marketing and design conduct which forms the gravamen of Transamerica's complaint was found permissible even for a monopolist. Those acts cannot, then, be impermissible for one whose market power falls short of monopoly. One act, the reduction of the 115/125 multiplexor channel capacity, would have violated the Sherman Act had IBM been in possession of monopoly power. The question addressed here is whether, assuming the market structure was such that IBM was dangerously close to monopoly power, the law forbidding attempts to monopolize has been broken.

Beyond the assumed dangerous probability of success there are two additional elements of the attempt offense, the specific intent to control prices or destroy competition, and predatory or anticompetitive conduct. There is some independent evidence of specific intent. IBM's Chairman deemed market share a consideration well above that of profit, and IBM fought hard to maintain market share. They undertook intensive studies of the chief PCM competitors in order to determine their viability and to predict what would be required to contain them. That is not enough to prove illicit intent. More than an intent to win every sale, even if that would result in the demise of a competitor, is required before it can be concluded a

defendant has the type of exclusionary intent condemned by the antitrust law. Intent and conduct are closely related;[114] and there must be some element of unfairness in the conduct before an anticompetitive intent can be found, as distinguished from the benign intent to beat the opposition.[115]

IBM's conduct for the most part, was beyond reproach. Only the 115/125 multiplexor degradation would have violated the Sherman Act had IBM possessed monopoly power, and it can only be characterized as unfair under the assumption that the market was so structured. The 115/125 multiplexor degradation was only thought unreasonable because it involved some use of the assumed monopoly power. A future market was involved, and it does not strike this Court as unfair or unreasonable for a non-monopolist to refuse to take a course of action that would make it easiest for others to copy its products or to compete for sales.

The conduct here was not illegal, was not predatory, was not anticompetitive, was not unfair, and did not unreasonably restrict competition. Transamerica has failed to prove that IBM acted with the specific intent to control prices or destroy competition, or that it engaged in anticompetitive or predatory conduct with that end in mind. This Court finds that IBM did not attempt to monopolize any part of commerce.

VIII.

DAMAGES

Transamerica has failed to establish liability on either the monopolization or the attempt claim. But even had it done so, it would still suffer an adverse judgment because its damages

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[114] *See* text accompanying notes 41 to 47, *supra*.

[115] *Pacific Engineering & Prod. Co. of Nevada* v. *Kerr-McGee Corp.*, 551 F.2d 790, 795 (10th Cir.), *cert. denied*, 434 U.S. 879 (1977); *Union Leader Corp.* v. *Newspapers of New England, Inc.*, 180 F. Supp. 125, 140 (D. Mass.), *modified*, 284 F.2d 582 (1st Cir. 1960), *cert. denied*, 365 U.S. 833 (1961). *See also*, Cooper, *Attempts and Monopolization: A Mildly Expansionary Answer to the Prophylactic Riddle of Section Two*, 72 Mich. L.R. 373, 395 (1974) and authorities cited therein.

proof affords the factfinder no opportunity to calculate resulting injury without resort to speculation.

Transamerica claimed it was damaged in two respects:

(1) that the revenues it actually received on its plug-compatible equipment were less than the revenues it would have received had IBM not violated the law (the lost revenues claim); and

(2) that IBM's actions forced it to abandon plans to purchase more plug-compatible equipment and lose the profits it would have earned by leasing that equipment (the lost profits claim).

There are four alternative lost revenues calculations, Alternatives A, B, C and D. All of the lost revenue alternatives involve some assumption about the rental rate Transamerica would have received on the plug-compatible equipment it bought from Telex and Marshall; they all require some assumption about the number of months, on average, the equipment could have been returning that full rental (the "rental life"); and all purport to make provision for revenue shortfalls attributable to causes other than IBM's act (the "revenue erosion" factor). In most cases the assumed rental rate is multiplied by the rental life for each piece of equipment, then a fixed percentage is subtracted as revenue erosion, to give the total revenue Transamerica claims it would have received absent IBM's acts. From this expected revenue figure Transamerica subtracts the actual revenues it received on the equipment. The revenue difference is said to be a measure of Transamerica's loss, because the expenses Transamerica actually incurred are claimed to be at least as great as the expenses it would have incurred had IBM not acted.

Lost revenue Alternative A is a calculation that produces a damages claim (before trebling) of $36,469,000. The disk rental rates assumed are those in effect immediately preceding IBM's 2319B announcement in December 1970. The rental lives used are equivalent to the depreciation lives assigned to Transamerica's equipment in late 1970 by its Executive Vice President, Dr. Fraser Wallace. Wallace assigned six year lives

to Transamerica's tape devices and its 2311-type disks (five years if they were purchased in 1971), and eight year lives to the 2314-type disks (seven years if purchased in 1971). The late 1970 rental rates were multiplied by the rental life remaining after a designated damage start date, then revenue erosion was subtracted. Revenue erosion was assumed to be zero for the first year of the remaining disk rental life and for the first six months of the remaining tape rental life. The next twelve months revenue were assumed to fall by 4 percent, and every year thereafter revenue is decreased by 15 percent. This 0-4-15 revenue erosion factor was suggested by Mr. Rush, Transamerica's President. Expected revenues were decreased by actual revenues to calculate lost revenue.

Lost revenue Alternative B is a damage claim for $19,994,000. Transamerica calculated the Alternative B rental lives from a study of Telex made in 1970 by an IBM financial analyst. The study includes a chart depicting the number of units Telex was expected to have installed with customers from 1970 to 1976. Transamerica assumed Telex would have to manufacture 10 percent more drives than the maximum depicted on the installation chart (a 10 percent "float"), and from this total number of units manufactured, together with the number installed each month, Transamerica purported to calculate the average number of months each manufactured unit would produce *some* revenue. Rental life (the average number of months each unit would produce *full* revenue, i.e., produce revenue at its original rent) was then calculated by reversing the study's assumptions of how much Telex's price would erode each year. The Alternative B rental life was multiplied by the same pre-act 1970 price assumed in Alternative A. No revenue erosion was applied to the quotient on the theory that price erosion and off rent units had already been considered in the Telex study. Expected revenue was increased by 10 percent of capital costs to reflect a salvage value, and then actual revenues were subtracted.

Lost revenue Alternative C is a $21,301,000 damage calculation. Pre-act prices were used here as well. The origin of the rental lives used was an IBM internal memorandum (the Nern Memo) sent to the author of the Telex study so that he

might check his calculations. The Nern Memo lives were multiplied by pre-act prices, and, as with Alternative B, a 10 percent salvage value was added before actual revenues were subtracted.

Lost revenue Alternative D is a $12,700,000 calculation that results from multiplying the price Transamerica was actually charging for its equipment during each month of the damage period, by the number of units of off rent in excess of 15 percent. The first 15 percent of the off rent units is a revenue erosion allocation. Only this portion of the off rent is assumed to be attributable to causes other than IBM's acts.

Transamerica's lost profits claim is grounded on a claimed intention to make additional purchases of plug-compatible equipment between 1972 and 1975. That intention is said to have been reflected in the profit and opportunity plans for 1971-1975 which were prepared by Transamerica in late 1970 and submitted to its parent, Transamerica Corporation, as indicative of long-range goals. According to Transamerica Corporation's Chairman, Mr. Beckett, and Transamerica's President, Mr. Rush, about one-half of the new computer equipment would have been plug-compatible peripherals. They further testified that the plan was not implemented because of IBM's conduct.

Transamerica contends that it would have invested $109,000,000 in plug-compatible equipment had the plan been carried out. Transamerica then theorizes that plug-compatible manufacturers would have entered into contracts whereby title to equipment would have passed to Transamerica on payment of a purchase price equal to 27 times the equipment's monthly rental price. The assumed contract would have provided that Transamerica retain all the rental revenues for the first 50 months. Thereafter Transamerica would have received 30 percent of the revenue and the manufacturer would get the balance.

The equipment would have produced some revenues over a 72 month life. Revenue erosion would be zero for the first year, 4 percent for the following year, and 15 percent thereafter. Estimated expenses are deducted from the anticipated rental revenues to give a lost profits figure of $51,200,000.

There is an alternative lost profits calculation as well. If one assumes, in addition to the 0-4-15 percent revenue erosion, that 20 percent of the units would not have produced any rental revenues after the first two years, the lost profits damages are $30,600,000.

The damage evidence advanced by Transamerica would permit total (untrebled) damages to be calculated between $43.3 million at one extreme, and $87.7 million at the other. In general, all the damage evidence can be characterized as showing a general decline in anticipated revenues and profits due to IBM's illegal conduct. The evidence that the decline was so caused consists of conclusory statements by Transamerica's corporate officers, and the inferences that can be drawn from the nature of IBM's acts and their tendency to injure one in Transamerica's position.

A plaintiff need prove no more in order to establish a *prima facie* case. As the Supreme Court said in *Bigelow* v. *RKO Radio Pictures*,[116]

> "... in the absence of more precise proof, the jury could conclude as a matter of just and reasonable inference from the proof of defendants' wrongful acts and their tendency to injure plaintiffs' business, and from the evidence of the decline in prices, profits and values, not shown to be attributable to other causes, that defendants' wrongful acts had caused damage to the plaintiffs."[117]

And that Court has suggested that a plaintiff's burden is satisfied by proof of *some* damage flowing from defendant's unlawful acts:

> "It is enough that the illegality is shown to be a material cause of the injury; a plaintiff need not exhaust all possible alternative sources of injury in fulfilling his burden of proving compensable injury ..."[118]

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[116] 327 U.S. 251 (1946).
[117] *Id.* at 264.
[118] *Zenith Corp.* v. *Hazeltine*, 395 U.S. 100, 114 n. 9 (1969).

So, a plaintiff in order to withstand a directed verdict, need only prove that defendant's acts were a material cause of its reduced profits, and causation may be inferred from the nature of the acts.

Plaintiff need not negate all possible alternative sources of injury in order to get to the jury. That was the nature of Transamerica's damages proof: general declines in overall revenues and profits, and acts by IBM which would tend to cause such declines. IBM's defense concentrated on showing that Transamerica's profit and revenue projections were speculative, and, even if those projections had some merit, that Transamerica's shortfall was attributable to causes for which IBM could not be held responsible.

Because it was possible for the jury to find that Transamerica's projections were reasonable, that the conduct complained of was all illegal and was a material cause of the shortfall, and that IBM failed to prove that other sources were also material causes, IBM's directed verdict motion on damages was denied and the issue was submitted to the jury. However, if the factfinder determines that some of IBM's conduct was illegal and some legal, or that the shortfall was attributable in part to other causes, or that the projections were unreasonable, Transamerica's damages evidence would give no guidance. For instance, if the challenged price reductions, FTP, and some of the design conduct were all determined to be legal competition on the merits, but the multiplexor degradation on the 115/125 constituted an attempt to monopolize or monopolization, then even if the overall projections are accepted as reasonable, and other causes are rejected, damages could not be fixed without resort to speculation or guess. Where a plaintiff's damage and causation proof is generalized its case rests on all the prerequisites to that generalization. This is especially true where, as here, particularization of injury is possible. [119]

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[119] Some courts have ruled that a plaintiff must come forward with the most accurate proof reasonably available. *Cf. Copper Liquor, Inc.* v. *Adolph Coors Co.*, 506 F.2d 934, 953-54 (5th Cir.), *rehearing denied*, 509 F.2d 758 (5th Cir. 1975); *Riss & Co.* v. *Association of American Railroads*, 190 F. Supp. 10, 18 (D.D.C. 1960); *ILC Peripherals Corp.* v. *IBM*, 458 F. Supp. 423, 436 (N.D. Cal. 1978).

If injury is shown to be attributable to factors for which the defendant cannot be held liable, then a damage case that ignores those factors must fail.[120] This Court finds that causes other than IBM's conduct led to at least most of Transamerica's profit and revenue shortfall, and that Transamerica's profit and revenue projections are inherently speculative. Thus, even if the Court were to find that some or all of IBM's conduct was illegal, damages could only be based on guesswork and could not be awarded.

Plaintiff could have done better. Rather than showing a general decline in profits and revenues, the damage proof could have been more closely connected to the individual acts complained of. Damages from the 115/125 multiplexor degradation, for instance, are limited by the number of tape devices in Transamerica's portfolio. Such limiting evidence was available, but not presented. Practically every major decision at IBM was made with the benefit of a precise market analysis. Those forecasts could have been used as the basis for determining how much impact each act had on the marketplace and on plaintiff. From the difference IBM expected each act to produce in its revenues, Transamerica could have estimated, on the basis of historical data, its share of the business that IBM wrongfully gained. Where IBM's own forecasts were not available, Transamerica could have used accepted forecasting techniques to predict impact per act. If Transamerica's proof were particularized in this manner, the influence of extraneous factors would have been filtered out, and the factfinder, in the event it found some activities to be lawful competition and others to be unlawful, would not have had to speculate as to how much injury each act caused.

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[120] *Coleman Motor Co.* v. *Chrysler Corp.*, 525 F.2d 1338, 1353 (3rd Cir. 1975); *Herman Schwabe, Inc.* v. *United Shoe Machinery Corp.*, 297 F.2d 906, 911 (2d Cir. 1962); *Momand* v. *Universal Film Exchanges*, 172 F.2d 37, 43 (1st Cir. 1948); *ILC Peripherals Leasing Corp.* v. *IBM*, 458 F. Supp. 423, 435 (N.D. Cal. 1978); *Admiral Theater Corp.* v. *Douglas Theatre Company*, 437 F. Supp. 1268, 1296 (D. Neb. 1977), *aff'd*, 585 F.2d 877 (8th Cir. 1978).

A. *Other Factors Materially Contributed to Transamerica's Injury.*

Transamerica's expectations were naive and its business strategy was ill-conceived. Except as a computer user, Transamerica Corporation had no experience in the computer industry prior to the formation of its computer subsidiary in late 1967. What it did have was money, and the computer industry during this period was a magnet for people with money to invest. The initial plan called for Transamerica to borrow from a sister corporation, Transamerica Financial Corporation (TFC) and to purchase whole computer systems with the borrowings. The computer systems were to be leased to end users at prices slightly below IBM's but for periods long enough to recoup expenses and make a healthy profit. Under the assumption that IBM could not alter its System/360 prices without violating the antitrust laws, Transamerica bought 360 systems. What Transamerica did not anticipate was the stiff price competition it soon faced from other leasing companies. Competitors' prices, 30 to 36 percent below IBM's, forced Transamerica out of the systems leasing field.

Recognizing its own inability to develop, market and maintain computer equipment, Transamerica decided the best course was to cooperate directly with manufacturers who could provide these skills. Under the "master sales agreement" concept they developed, Transamerica planned to, and did purchase computer equipment from manufacturers who had already leased the equipment to an end user. The manufacturer received immediate cash payment, but remained obligated to maintain the equipment, and, when leases expired or were otherwise terminated, the manufacturer was obligated to refurbish and remarket. Transamerica was to receive all rents until it had recovered its capital investment and a specified profit. Thereafter the residual rents were to be divided between the manufacturer and Transamerica.

Transamerica was attracted to plug-compatible peripheral manufacturers because it presumed that the System/360 peripherals they were producing would remain in demand for a relatively long time. It felt prices on that equipment would

remain stable, since IBM would not risk antitrust liability by responding to PCM price competition, and because the investment tax credit (ITC) was available on that equipment and the ITC could be used by the parent corporation to offset its consolidated tax liability. In October of 1968 Transamerica contracted with Marshall to buy $5,000,000 worth of on lease 2311-type disk drives. In April of 1969 Transamerica contracted with Telex to buy $5,000,000 worth of on lease 729-type and 2400-type tape drives. In July of that year another contract with Telex was signed which obligated Transamerica to buy $45,000,000 worth of on lease 2311-type and 2314-type disk drive and control unit subsystems. Finally, in August of 1970, Transamerica contracted for anther $10,000,000 worth of 2400-type tape drives from Telex.

Typically, these contracts obligated Transamerica to pay a price equal to over 40 times the equipments' monthly rental rate (almost the full retail price), and obligated the manufacturer to maintain and remarket throughout the rental life.

Only after 70 months could the manufacturer hope to share in the residual rental fees.

The contracts themselves contained the seeds of Transamerica's disappointment. Transamerica's interests and the manufacturer's were divergent. The manufacturer, having been paid at the outset, had little incentive to spend time and money maintaining and remarketing Transamerica's gear. The lure of residual rentals six years distant was insufficient. Telex was attracted to Transamerica's financing because it needed capital to fund development projects, and once those developments became realities, Telex's incentive to market Transamerica's older equipment, instead of its own newer, more exciting and more profitable follow-ons, dwindled to nothing. Transamerica says now it expected Telex would market its equipment to second and third users, people who were not so interested in the latest technology. Assuming there are customers with little interest in better performance at a lower price, there is no evidence that Telex knew of any. The entire PCM industry concentrated on "leading-edge" customers, large users who demanded the latest in technology and the best price/performance.

And the peripherals that Transamerica had to offer were certainly not the latest technology. Telex and Marshall unloaded $6,000,000 worth of 2311-type disk drives onto Transamerica in 1968 and 1969. They were equivalent to a device announced in early 1964 by IBM. Telex recognized their obsolescence and was reluctant to purchase them from Information Storage Systems (ISS), their disk supplier. In June of 1970, Telex requested ISS to discontinue production of these models because the market for them was shrinking. Transamerica didn't want them either, but was obligated to purchase them by Telex in order to buy the newer 2314-type devices.

The 2314, announced by IBM in 1965, was part of the reason Transamerica's 2311 types were already obsolete. But by the time Transamerica signed a $45 million contract with Telex (the bulk of which was for 2314-type subsystems), the 2314 was also becoming a thing of the past. In June of 1970 IBM announced the long rumored System/370 fourth generation of computers, and with it the 3330, a disk device far superior to 2314 types. Six months later Transamerica's regional manager in charge of the Telex account concluded that the 3330 had obsoleted all of Telex's 2314 types.[121] In August of 1971 Telex announced an improved double-density 2314-type, and a 3330 copy as well. Virtual storage, announced in 1972, further reduced demand for the slower 2314 technology, as did the March 1973 IBM announcement of the 3340. Customers appreciated the improved price/performance of the newer disks. Transamerica lost little ground to the older, low priced IBM products at issue here; 73 percent of Transamerica's 2314-type customers replaced that equipment by the newer technology offered by IBM and the PCMs. The 2314-type disk, when Transamerica bought it, was about to become a thing of the past.

Transamerica's 2400-type tape drives were no better. Telex sold them to Transamerica a mere three months before dis-

[121] In another context, when arguing that the 50-month rental life assumed by IBM for the 2319B was unrealistically long, Transamerica acknowledges the negative impact of the 3330 on 2314-type devices. Here they ignore it and would have this Court believe that Wallace's 96-month rental life on the same type of equipment was reasonable.

continuing their production. When the second Telex tape contract was signed in August of 1970, IBM had already shipped an improved generation of tapes, the 2420s, and Telex had already announced its 2420' equivalents. Three months later IBM announced Aspen (3420) outmoding the 2420s. As Transamerica argues elsewhere,[122] "Mandan, [a 2400-type], was old technology, dating back two generations." In March of 1973, IBM announced Birch, still more 3420 models with vastly improved tape density (6250 bpi v. 1600 bpi). By late 1973, Telex classified the NRZI 2400s (about one-half of Transamerica's stock) "prior technology" and thought them unmarketable.

Transamerica's indifference to the level of technological sophistication of the equipment in which it invested is well illustrated by the purchases on which no damages are claimed. The bulk of the first Telex tape contract was for 729-type drives. IBM announced the 729 in 1957, and it was obsoleted in 1964 when the third generation of computers, the System/360 was announced. The 729s would only attach to second-generation equipment, but Transamerica paid $2.9 million for 729-type drives in 1968. Non-plug-compatible investments were also untimely. In February 1971, Transamerica's outside auditors suggested a 20 million dollar equipment write down because of the high off rent experienced. Only 20 percent of the equipment they addressed is at issue here. And two months later Transamerica's own internal assessment echoed that concern. Obsolescence had caused a $25,000,000 decline in the value of non-plug-compatible equipment.

Some of Transamerica's problems have to be pinned on its poor management. Its first President, according to an officer of Transamerica Corporation, failed to provide leadership or control, exercised poor judgment, misrepresented matters to the parent's officers, and violated the corporation's policy guidelines. The problems didn't come to light initially because Transamerica Corporation made the error of allowing the president to locate Transamerica in southern California, away

[122] Transamerica advances this argument against the reasonableness of a 58-month rental life for Mandan, while maintaining a 72-month life was reasonable for its own 2400-type equipment.

from the parent, where its activity was difficult to monitor. By late 1969, the difficulties became clear, and the president was terminated. During 1970 Transamerica operated without a President. Fraser Wallace, the Executive Vice President, became acting Chief Executive Officer, and Edwin Carter (the Transamerica Corporation officer referred to above) was the acting President. But Carter could only devote part of his time to Transamerica, and Wallace, according to Carter, ignored problems until the crisis stage, entered agreements that violated corporate policy, was administratively incapable, and caused Transamerica substantial losses. Finally in 1971, James Rush became President. However, Rush's experience was as an administrator. He had little knowledge of computer technology or the competition Transamerica faced. None of these executives had any experience with third-party leasing. The combination of inept management and no management produced predictable results. Working conditions at Transamerica were confused and chaotic, expensive contracts for obsolete merchandise were signed and losses inevitably followed.

Even had IBM remained the sleeping giant Transamerica presumed it to be, some of the difference between Transamerica's optimistic projections and reality would have to be ascribed to hungry PCMs scrambling to place their third generation peripherals at a time when the introduction of the fourth generation's was shrinking the market. By early 1974, Transamerica had reduced its price for 2314-type disk drives to under $200 per month. The IBM prices complained of here were $333 per month. Clearly the PCMs were cutting prices too. As early as November of 1970, Telex recognized that Peripherals General, California Computer Products, and Memorex would create price instability in the disk market. And customers took advantage of that. One-third of Transamerica's 2314-type disk customers were lost to other PCMs. The same PCM price competition that eventually goaded IBM into action, would, and did, cause Transamerica to lower its prices substantially below the prices assumed in its damages calculation.

Besides the injuries Transamerica claims were directly caused by IBM's pricing product actions, it is also claimed that

Telex and Marshall were injured, and that the injury to the viability of the maintenance and marketing subcontractor indirectly injured Transamerica's ability to place its equipment. Telex was allegedly injured in its ability to secure financing, its ability to hire and retain qualified employees, and its ability to market, since customers were concerned the company might fail. Wholly aside from the question of whether Transamerica has standing to complain of the injury to a business partner, it appears that the problems of Telex and Marshall were self-induced, or at least not IBM-induced.

Other PCMs fared much better than Telex and Marshall. PCMs' plug-compatible disk revenues increased dramatically from $4.3 million in 1968 to $857.3 million in 1975. During that same period PCM tape revenues rose steadily from $23.7 million to $352.5 million. There was nothing about IBM's conduct that would have caused Telex or Marshall to be more impacted than others; if they could not keep pace, the cause must lie elsewhere.

Marshall's products were unreliable, had excessive downtime, and were highly vulnerable to the competition of other PCMs.

Transamerica's notion that Telex was unable to obtain financing because of IBM's conduct is refuted by the evidence. Following FTP, Telex was still able to negotiate lines of credit totaling $69,000,000, and in November of 1971, Telex sold 27.5 million dollars worth of debentures to the public. If the financial community lost confidence in Telex, it could largely be traced to valid criticism of Telex's accounting methods made by the SEC and financial commentators in late 1969 and early 1970. Telex was using the financing method of accounting for its leases. Once a lease was signed, the equipment was accounted for as if it were sold. No provision was made for the substantial risk that the machine might not produce sufficient revenues to cover the recorded sale price. And the maintenance, remarketing, interest and other expenses on that equipment were to be charged against future periods. In this manner Telex kept its earnings, and its stock price artificially inflated. When the bubble burst, Telex was forced to restate its earnings and

the stock price sank along with investor confidence. In late 1972, the Accounting Principles Board issued Opinion 27 (APB 27) mandating a more conservative approach. Telex reversed transactions it had previously booked as sales; the effect on Telex's fiscal 1973 results was a devastating $18 million loss. Investors and customers understandably became wary.

More than questionable accounting hurt Telex. By mid-1971 it had little to offer the customer, and what it did offer often functioned poorly. In June of 1971, Telex salesmen had only the 2420-type tape to sell; Telex's factories were not building anything else. Telex was slow to offer a 3420 equivalent, and as a result, other PCMs began replacing Telex's 729 and 2400 type tape drives with their 3420-types. Later, when the Telex 3420-type was in shipment, Telex expected one-half of them to be defective on arrival, and 25 percent to fail badly within the first three months of use. The Telex 2400-type tapes were also experiencing difficulties. Transamerica Corporation's own Computer Division found them "proven to be unacceptable in all regards." Telex, suffering from a lack of qualified tape engineers and field maintenance technicians, was late in starting, and even then produced poor quality equipment.

If Transamerica suffered problems indirectly through Telex, at least some part of those problems was due to the serious deterioration of relations between the two. In 1970, Transamerica invested heavily in a company called Computer Micro-Image Systems (CMS). CMS began to experience financial problems, and a worried Transamerica induced Telex to invest some time and money in CMS by holding the promised August, 1970 $10 million tape agreement as hostage. For its part, Transamerica agreed to pay Telex for its disk purchases at time of shipment rather than upon acceptance (about a 60 day "float" on $26,000,000 in remaining disk purchases), concluded the tape agreement, and, at least according to Telex's interpretation, promised Telex it would be held harmless from its CMS involvement. By March of 1971, Telex had invested $1.5 million in CMS, and CMS went into bankruptcy. When Telex tried to collect on the guarantee, Transamerica balked.

As a result of Transamerica's refusal to reimburse Telex, Telex concluded it would not be doing any additional business with Transamerica, and it would interpret existing contracts strictly in Telex's favor.

In November of 1971, Telex attempted to prematurely fulfill the substitution obligation on Transamerica's 2314-type disk. Transamerica disputed their right to do so. Maintenance also became an area of dispute, with Transamerica ultimately forced to pay Telex an additional $1.25 million to cover maintenance costs. And Transamerica felt that Telex's negligent record keeping was costing it money.

In sum, relations between Telex and Transamerica had broken down, Telex's products were technologically outdated and of inferior quality, and investors and customers alike shied away from a company whose accounting practices were publicly criticized. Even if damage to Transamerica by virtue of injuries to Telex were cognizable, Transamerica's damage claim makes no provision for the other factors that materially caused Telex's problems.

Transamerica's damage claim also fails to take account of the recession that led to a decrease in demand in 1970 and 1971, and ignores the effect of the Tenth Circuit's opinion in *Telex*,[123] although Transamerica decided to increase the depreciation on its Telex equipment by $1.4 million as a result of that decision.

Transamerica's revenue aspirations were built on sand. They depended on others to perform essential services, when those others had little incentive to perform. They counted on a tax benefit that was later suspended. They assumed a continued demand for third generation peripherals at a time when the fourth generation was being born. They trusted incompetent and inexperienced management. They ignored the threat of competition from other PCMs and the deterioration of relations with their principal supplier. And they assumed that the antitrust laws had so stifled IBM that non-competitive pricing conditions would prevail indefinitely. Factors other than IBM's conduct were the predominant cause of Transamerica's lost revenues.

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[123] *Supra* n. 5.

According to Beckett and Rush, the plan to invest further in plug-compatible equipment was not implemented because of IBM's price cuts. This Court does not accept the single-cause theory with respect to the lost profits claim either. It does not appear the plan was ever firmly embraced by management, nor does it appear likely that it ever would have been.

The 1971-1975 Transamerica Profit and Opportunity Plan ostensibly called for a doubling of the subsidiary's portfolio, an investment of almost ten times the parent's consolidated 1970 earnings. The previous year's plan had called for a limitation on purchases, and in October of 1970, the Transamerica Board, smarting from the obligations its officers had incurred, required that all major transactions involving over $1 million be subject to board approval. It was, of course, possible that the corporation made such an abrupt about-face, but the evidence that they did so is slim. There is no contemporaneous documentation of any discussions regarding the plan, nor was there ever any specification of manufacturer or equipment type. There is no evidence of any initial contract negotiations, product evaluations, or any other preparatory steps. And the Profit Plan was never approved by Transamerica's board although Transamerica Corporation's procedures called for that before Profit Plans become operative.

Transamerica appears to have been winding down its operations even before the IBM conduct at issue here. In October of 1970, its regional market offices, the contact point with manufacturers, were closed. The reasons for the cutback are evident. Computer equipment was becoming a less attractive investment. The Investment Tax Credit was suspended in 1970, and even if it were to be revived, the parent corporation had a surplus of carry over ITC anyway. Transamerica had changed its accounting procedures, and plug-compatible investments appeared much less profitable as a result. And Transamerica's track record was poor. In 1970, it recorded a $5.5 million pre-tax loss. One year later that loss grew to $9.6 million.

The source of funds for plug-compatible investing is also questionable. The parent's consolidated earnings were down

sharply in 1970, and the TFC loan was drying up. TFC's bond rating suffered because the intra-company loan was viewed with suspicion, and TFC's creditors joined in that criticism. Because of that, Beckett decided that Transamerica should decrease the TFC loan balance to $100 million by the year-end 1973. But no mention is made of an alternative source of investment funds.

APB 27, issued by the Accounting Principles Board had a heavy impact. It effectively precluded leasing companies from acting as mere financial intermediaries as Transamerica had. Transamerica would have had to shoulder some maintenance and re-marketing responsibilities on its future equipment leases. But no indication appears as to how this was to be done.

The 1971-1975 Profit and Opportunity Plans were a dream. Nothing precludes a corporation from sketching its future so lightly, but the law precludes that corporation from collecting damages when the dream fails to become a reality. An antitrust plaintiff must have an intention to enter a business and a certain degree of preparedness before a business expansion concept can be compensated in damages.[124] Transamerica has shown neither.

Plaintiff aggregated some very large numbers to represent its lost revenues and profits, and charges IBM with responsibility for the entire damage. This Court finds that Transamerica's lost revenues were predominantly caused by factors other than IBM's conduct, and that Transamerica's investment plan, if it ever reached the status of a corporate intention, was abandoned primarily for reasons other than the IBM actions challenged here. Under this state of the evidence, even if this Court were to find that some or all of IBM's conduct violated the Sherman Act, and that that conduct caused some material part of the loss, damages could not be fixed except by guess.

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[124] *Hayes* v. *Solomon*, 597 F.2d 958, 973 (5th Cir. 1979); *Martin* v. *Phillips Petroleum Company*, 365 F.2d 629, 633-34 (5th Cir.), *cert. denied*, 385 U.S. 991 (1966).

B. ***Transamerica's Damage Estimates Are Not Based On Credible Evidence.***

If the causation problem could somehow be solved, if this Court were to find that IBM's conduct was the primary or sole cause of Transamerica's loss, the verdict would still be for IBM because the damage computations are not based on reasonable assumptions. The best example of that is Rush's revenue erosion factor.

It might be argued that Transamerica has made some provision for other causes by subtracting the 0-4-15 percent revenue erosion from its total revenue and profit expectations. But these numbers are no more than Rush's unsubstantiated self-interested guess. The fact that a witness has recognized other causative factors and decreased the damages by an arbitrary figure does not change the character of the result. Guesswork is guesswork, whether it originates on the witness stand or in the jury room.

If Rush were qualified as an industry or economic expert, his *ipse dixit* might carry more weight; but he is not. He has not had any formal education in computer sciences or the computer industry. He displayed a minimum of technical knowledge on the witness stand; and his work experience has chiefly been as an administrator. The numbers assigned to revenue erosion were pulled out of thin air. There was no comparison with the off-rent experiences of other leasing companies, or with similar firms in other industries. Indeed, an examination of Transamerica's off rent experience with non-plug-compatible equipment leads to the conclusion that the modest figures Rush applied are grossly understated and incurably optimistic.

There is more to substantiate the various rental lives assumed, but not enough. Wallace's depreciation lives were probably chosen with an eye toward maximizing the ITC on the equipment. They are unreasonably long. Wallace assigned the same 6 year life to the vintage 729 type tape drives as he did to the 2400 types, and selected disk subsystem lives of up to 8 years while Telex was depreciating the same equipment over four. Products not at issue here, to which Wallace also assigned long lives, suffered large amounts of off rent within a short time.

The rental lives calculated from the Telex study were improperly calculated since no provision was made for the fact that the study included purchased units and rental units in the same inventory curve, and there is no evidentiary support for the assumption of a ten percent float factor. Nothing more than the bare numbers support the Nern lives. Nern's assumptions appear nowhere in the record. The critical assumptions behind the Telex study and the Wallace lives are also missing. What assumptions do appear are untenable. Wallace assumed that the System/360 would not be displaced by the System/370, and the Telex study was based on the assumption that IBM would not do anything to improve its position in the peripherals markets.

Transamerica's lost revenue damage calculations are not based on credible evidence. Neither are the lost profits calculations.

The lost profits claims assume that manufacturers with products that would produce full rental revenues for 72 months would sell those products to Transamerica for a price equal to 27 times the monthly rental and a share of the rentals after 50 months. Only financially unstable concerns, desperately in need of cash would have done so. Telex turned down similar propositions because it found bank financing less expensive. Transamerica did enter four contracts with non-plug-compatible suppliers on comparable low multiple, quick-residual terms, but those suppliers were all financially distressed. A lost profits calculation that fails to provide for the contingency that a critical business partner would be bankrupt, cannot logically be predicated on a business plan that would only appeal to partners on the verge of financial disaster.

APB 27 is another factor that makes the envisioned contracts unlikely. Following that opinion, manufacturers were unable to book their transactions with leasing companies as sales if, as in the past, they retained remarketing and maintenance obligations. Few manufacturers would be willing to deal on that basis. The market for Transamerica's financing was drying up.

Transamerica was incapable of shouldering marketing and maintenance responsibilities itself and would have had to have made some provisions for those services. But no clear plan for accomplishing that emerges from the lost profits proof. This need to provide services also makes untenable the lost profits assumption that future expenses would run parallel to historical expenses.

The likelihood that, absent IBM's acts, Transamerica's expansion would have been successful, is severely undermined by the record of their dismal past. Through 1971 Transamerica lost about $16 million before taxes, and each year things were getting worse. While a past profit record might not be indispensable to lost future profits proof,[125] its absence goes a long way towards discrediting fanciful projections.

Courts have been properly sympathetic to the antitrust plaintiff's plight in proving what might have been, but not so sympathetic that they have permitted damage claims to be grounded on speculation rather than on relevant data.[126] Transamerica's damage estimates failed to meet this test. Where opinions were offered, they were not based on relevant data, and the assumptions behind those opinions were not shown or were not realistic.[127] Future profits were predicted only by assuming hypothetical transactions which never were likely to occur and were never even proposed.[128] And non-liability factors, which had a profound effect, were dismissed with an arbitrary and insignificant revenue erosion deduction.[129]

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[125] *See Autowest, Inc.* v. *Peugeot, Inc.*, 434 F.2d 556, 565-67 (2d Cir. 1970); *Flintkote Company* v. *Lysfjord*, 246 F.2d 368, 392-94 (9th Cir. 1957); *Delware Valley Marine Supply Co.* v. *American Tobacco Co.*, 184 F. Supp. 440, 444-49 (E.D. Pa. 1960), *aff'd*, 297 F.2d 199 (3rd Cir. 1961).

[126] *Bigelow* v. *RKO Radio Pictures, Inc.*, 327 U.S. 251, 264 (1946); *Sunkist Growers, Inc.* v. *Winckler and Smith Citrus Prod. Co.*, 284 F.2d 1, 34 (9th Cir. 1960); *Wolfe* v. *National Lead Co.*, 225 F.2d 427, 433-34 (9th Cir. 1955).

[127] *See Lessig* v. *Tidewater Oil Co.*, 327 F.2d 459, 473-74 (9th Cir. 1964).

[128] *See Webb* v. *Utah Tour Brokers Association*, 568 F.2d 670, 677 (10th Cir. 1977).

[129] *See Coleman Motor Co.* v. *Chrysler Corp.*, 525 F.2d 1338, 1352 (3rd Cir. 1975).

This Court finds that Transamerica's evidence fails to afford it a basis on which it might justly and reasonably, have estimated damages that might have flowed from IBM's acts.

IX.

CONCLUSION

Transamerica, charged with proving that IBM had monopoly power, that IBM's conduct violated the Sherman Act, and that such conduct caused injury to Transamerica, has failed to carry its burden of persuasion on each of those critical elements.

The proof of monopoly power rested on a weak base. To find monopoly power, this Court would have to accept a narrow market definition, combine it with a distorting measurement technique, and evaluate the resulting statistic against a background that ignores the dynamic competitive history of the computer marketplace.

Damages proof also failed to persuade. Transamerica's projections were unreasonably optimistic. Its approach to causation leaves the factfinder, having found that some significant non-IBM causes were responsible for Transamerica's misfortunes, with no way to fix any damages attributable to IBM except by guess.

Finally, IBM's conduct could only be found illegal if this Court were to adopt a novel theory with serious and far reaching anticompetitive effects. This case has been, first and foremost, a case about conduct—and what tactics a firm with assumed monopoly power can employ. Transamerica would subject a monopolist to punitive damages for any action that tends to preserve that market status, unless that action was inevitable. Thus, monopolists could not reduce price from a price-maximizing price, could not alter the design of a product, and could not change marketing techniques, if any alternative was open to them which would have less impact on competitors. The failure to walk the narrowest path would lead to liability because, on that theory, competition would otherwise

be "unnecessarily" excluded,[130] and monopoly status would have been "willfully"[131] preserved as opposed to "thrust upon"[132] the defendant as the "passive beneficiary" [133] of natural forces.

This Court will not attempt to improve upon the careful critical analyses of the cases and language whereon Transamerica relies.[134] It suffices to say that Transamerica's interpretation of the seemingly restrictive language becomes untenable when that language is considered in the light of contradictory language from the same cases and conduct permitted to a monopolist in other cases. This Court's main concern here is with the consequences of Transamerica's suggested rule.

Monopolists do not wear a label proclaiming their market status. Ascertaining that status is unfortunately difficult, whether the determination is to be made by a court, or even by the suspected monopolist. A market must be defined and measured, the market's characteristics must be evaluated, and its historical performance must be considered. This appraisal of market power is time-consuming, arduous, *and imprecise*. As a result, one must expect that any legal rule governing a monopolist's conduct will affect all firms large enough to fear that some disgruntled competitor will charge them with the emotion-provoking title of "monopolist."

Large firms attempting to conform their conduct to Transamerica's proposed rule would have a difficult time indeed. Any successful action they might take to win sales necessarily tends to improve or preserve their market position. Disappointed competitors, if they can conceive of some alternative price, product, modification or practice they would have preferred, would be encouraged to bring suit. Even if the large firm recognizes and tries to resolve the problems, it cannot assure its

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[130] *See United Shoe*, *supra* n. 13, at 344-45; *Greyhound*, *supra* n. 4, at 498.

[131] *See Grinnell*, *supra* n. 4, at 570-71.

[132] *See Alcoa*, *supra* n. 44, at 429.

[133] *See id.*, at 430.

[134] *See, e.g., Berkey*, *supra* n. 5, at 273-74; *Telex*, *supra* n. 5, at 927; *Borden Inc.*, 1978 Trade Reg. Rep., Case No. 21,490 at 21,517-18 (FTC 1978) (Pitofsky concurring); 3 P. Areeda and D. Turner, *Antitrust Law*, Section 608 at 13-26; Sullivan, *supra* n. 15, at 94-97.

safety. One alternative might exclude or restrict one set of potential plaintiffs, while another set would be affected by the other alternative. Management's safest course might be to do nothing, but that, of course, would violate their duty to shareholders, and would do nothing to benefit a healthy, innovative and competitive market.

It is an unwise policy for the law to coddle competitors, especially if the protection comes at the expense of destroying a larger firm's incentive to compete. Even companies that choose to enter dominated markets must be prepared to face competition on the merits. Where a monopolist chooses an alternative that does not unreasonably restrict competition, the law is not offended. It is the choice of an unreasonable alternative, not the failure to choose the least restrictive alternative, that leads to liability.

IBM did not lie dead in the water when faced with competition. It took action. And the action it took may have caused some competitors to suffer more than other actions would have. But the action IBM took, under the circumstances in which it acted, did not unreasonably restrict competition, and thus, did not violate the law.

APPENDIX C

IN THE

United States District Court

FOR THE NORTHERN DISTRICT OF CALIFORNIA

In re IBM Peripheral EDP Devices Antitrust Litigation
MDL No. 163-RM

TRANSAMERICA COMPUTER COMPANY, INC., a corporation, *Plaintiff*, v. INTERNATIONAL BUSINESS MACHINES CORPORATION, a corporation, *Defendant*.	**C-73-1832 RHS** **ORDER** **October 3, 1978**

SCHNACKE, District Judge:

Defendant, contending that the issues involved in this complex antitrust case are beyond the capabilities of an ordinary jury, has moved to strike plaintiff's jury demand. Defendant anticipates that because the trial is expected to be lengthy, it would be impossible to impanel a fairly representative jury and argues that submission of these issues to a nonrepresentative, incompetent fact-finder would violate due process of law.

This Court recognizes the difficulties that a lengthy, complex jury trial entails, but despite these difficulties, the command of the Seventh Amendment is clear. A jury trial would not be constitutionally inappropriate. Defendant's motion to strike the jury trial demand is denied.

ON MOTION TO CERTIFY APPEAL

In the event that any of its other motions heard on September 22, 1978 are denied, defendant has moved for an order pursuant to 28 U.S.C. § 1292(b) certifying that the

motion denied involved a controlling question of law, that there is a substantial ground for difference of opinion, and that an immediate appeal may materially advance the ultimate termination of this litigation. Even if a controlling issue of law were involved in any motion denied today, an appeal at this point would certainly not advance the termination of this litigation. The motion to certify for appeal is denied.

ON MOTION FOR SUMMARY JUDGMENT— ANTITRUST VIOLATIONS

Plaintiff claims that certain actions taken by defendant in connection with the design of two of its products, System 370 Models 115 and 125, were anti-competitive and violated the antitrust laws. Defendant has moved for summary judgment with respect to these actions contending that plaintiff should be foreclosed from asserting their illegality by force of the finding in *Memorex Corporation* v. *International Business Machines Corporation*, 458 F. Supp. 423, 442-44 (N.D. Cal. 1978) (hereinafter, *Memorex*), that these design decisions were not anti-competitive, were not predatory, and did not unnecessarily exclude competition. Defendant also argues that inclusion of these allegations at this late stage of the proceedings would severely prejudice its defense.

The finding in *Memorex* that defendant relies on was based upon the failure of the plaintiff there to adduce sufficient evidence to support a contrary finding [*Memorex*, at 444], and plaintiff here, neither party nor privy to that case, should not be bound by another's failure of proof. Since defendant faced similar claims in the recent *Memorex* case, and since discovery has proceeded for some time on these issues, prejudice will not result.

Accordingly, summary judgment is denied.

ON MOTION FOR SUMMARY JUDGMENT— RELEVANT MARKET

Plaintiff claims that defendant has violated the antitrust laws, specifically Sections 1 and 2 of the Sherman Act (15 U.S.C. §§ 1 and 2), by monopolizing and attempting to

monopolize three relevant product markets: (1) general purpose electronic digital computer systems; (2) tape drives and controllers plug-compatible with IBM central processing units; and (3) disk drives and controllers plug-compatible with IBM central processing units. Defendant has moved for summary judgment with respect to the latter two markets contending that the substitutability of competing products from the consumer's viewpoint and the ease with which other manufacturers could enter the markets indicate a cross-elasticity of both demand and supply of such a degree that these markets must be determined to be too narrowly drawn as a matter of law. Defendant cites *Telex Corporation* v. *International Business Machines Corporation*, 510 F.2d 894 (10th Cir.), *cert. dismissed*, 423 U.S. 802 (1975), and *Memorex Corporation* v. *International Business Machines Corporation*, 458 F. Supp. 423 (N.D. Cal. 1978), in support of that proposition.

Relevant market is essentially a question of fact [*Telex Corporation* v. *International Business Machines Corporation*, 510 F. 2d at 915]. Defendant does not contend otherwise. Prior cases are instructive on this factual question, but since plaintiff was not a party to those actions, they are not binding.

Because resolution of this factual question will require a number of conclusions to be drawn from the evidence, summary judgment would be improper and is hereby denied.

ON MOTION FOR SUMMARY JUDGMENT— DAMAGES ISSUES

Plaintiff TCC claims that defendant IBM's violations of the antitrust laws (specifically 15 U.S.C. §§ 1 and 2) resulted in: lost revenue on computer equipment owned by TCC at the time of those alleged violations; lost profits on additional investments it would have made between 1972 and 1975 had IBM not violated the law; and the lost benefit of the investment tax credit that TCC would have realized on those planned investments. Defendant IBM has moved for summary judgment on the lost profit claim and on the investment tax credit claim. IBM contends that the lost profits are too speculative and

that such damages would be tantamount to awarding prejudgment interest on the lost revenue claim since TCC planned to use revenue to finance the 1972-75 investments. And, IBM predicts that to entertain the lost investment tax credit claim would be to mire this litigation in a maze of collateral issues.

The lost profit claim is not so speculative that the trier of fact should be precluded from judging it on its merits. If, as IBM suggests, the foundation of the lost profit claim, the 1971-75 Profit Plan prepared by TCC management, was based on overly optimistic assumptions, then that factor can be taken into account by those charged with making factual determinations. The law does not require that lost profit claims be calculated with mathematical precision in antitrust cases [see *Zenith Radio Corporation* v. *Hazeltine Research, Inc.*, 395 U.S. 100, 123 (1969); *Autowest, Inc.* v. *Peugeot, Inc.*, 434 F.2d 556, 566 (2d Cir. 1970)].

The fact that the source of some of the funds for the proposed investments was to be current revenues does not allow the novel characterization of anticipated profits as prejudgment interest. TCC is not asking for a fixed return on the lost revenue; the lost profits it seeks would have resulted from the investment of both capital and labor, and would have rewarded plaintiff's entrepreneurial efforts. Accordingly, the motion for summary judgment on the lost profit claim is denied.

The investment tax credit claim is based on an estimated tax benefit of $6,193,000 TCC allegedly would have realized had it invested as planned. Because of the tax consequences attendant to a damage award TCC (assuming a tax rate of 52%) calculates it requires $12,900,000 to be made whole.

It is with good reason that courts have repeatedly refused to take the tax consequences of damage awards into account. The difficulty involved in recomputation of prior years' taxes and the speculation that would be required [see *Hanover Shoe, Inc.* v. *United Shoe Machinery Corp.*, 392 U.S. 481, 503 (1968); *Paris* v. *Remington Rand, Inc.*, 101 F. 2d 64, 68 (2d Cir. 1939)] would complicate this already complex litigation. Defendant's motion for summary judgment on plaintiff's investment tax credit damages is granted.

ON MOTION FOR SUMMARY JUDGMENT—PRICING

Plaintiff TCC has designated the pricing of certain products at negative or narrow profit margins and the effect on price of a long term lease known as Fixed Term Plan (hereinafter, FTP) as acts of defendant IBM which violated the antitrust laws (specifically 15 U.S.C. §§ 1 and 2). IBM has moved for summary judgment on these acts claiming that TCC cannot show that its pricing actions were predatory without the utilization of cost adjustments which are impermissible as a matter of law.

The three adjustments which TCC makes to IBM's projected costs for its products which cause IBM the most concern are: (1) changes in the allocation of revenue apportioned costs; (2) the inclusion of opportunity costs; and (3) the inclusion of impact costs.

Revenue apportioned costs are those costs which IBM's accounting procedure allocates to IBM products on the basis of the amount of revenue that product is expected to produce. A set percentage of the total expected revenue is added to the product's other costs in order to account for costs not reflected as direct costs, engineering overhead, or manufacturing overhead. Marketing expenses, personal property taxes on leased equipment, and the expenses of corporate headquarters are examples of costs which are revenue apportioned. The amount of revenue apportioned cost attributed to a product is thus directly proportional to both the number of units sold or leased and to the price of each unit. So, if the price of a unit is reduced, revenue apportioned costs for that unit would be proportionately reduced.

TCC feels that this accounting method serves to understate a product's costs in the event of a price cut, allowing IBM to hide behind its accounting procedure when it predatorily prices, and suggests holding the revenue apportioned costs attributed to a product constant when prices are dropped. Whether one method of accounting for costs actually incurred or another is proper is essentially a question of fact, and thus is not a proper subject for summary judgment.

The concept of opportunity costs is a decision making device that economists use to compare alternative courses of conduct. If an investor faces two mutually exclusive alternatives, one which would produce a return of $8 per year on an investment of $100, and another which would produce a return of $6, the opportunity cost that is to be ascribed to choosing the first alternative is the profit foregone on the second or $6. The first alternative would produce a *relative* profit of $2 while the second would produce a *relative* loss of $2.

TCC has taken this concept one step further than the decision making stage and seeks to subtract from the profits IBM predicted it would realize on a particular product the estimated profits that might have been realized on a product that could have been produced in its stead. In this fashion, TCC concludes that IBM priced below cost. But, even aside from the speculative nature of the alternative's profits, the use of the concept of opportunity costs in this fashion must be held improper as a matter of law. Such costs are not reflected in a profit and loss statement, and such a theory would restrict the manufacturer with monopoly power to always choosing that alternative predicted to produce the greatest monetary rewards. It would have to blind itself to the host of factors that influence such a decision and could quite possibly lead to a more socially desirable result. The unquantifiable risks associated with a particular alternative, technological considerations, and all the non-economic influences that affect a manufacturer's social responsibilities would all have to be forgotten. Such was not the intent of the Sherman Act and is not what is meant by predatory pricing.

The concept of impact costs is similar. This is the reduction in anticipated future profits on an existing product line caused by the introduction of a new product line. It differs from opportunity costs in that one alternative path, the existing product's manufacture, is already being followed, and in that the alternatives faced are not necessarily mutually exclusive. For example, the introduction of a popular and revolutionary new tape device may give rise to impact costs (reductions in anticipated profits) as the result of the withdrawal from

production of an outmoded tape device, and also impact costs that result from customers switching from older but continued tape devices to the newer model. Again TCC would take these costs beyond the planning stage and subtract them from the new product's profits in determining whether the price set was predatory and below cost. Such a rule of law would be a disincentive to research and innovation, and has all the drawbacks that calculation of opportunity costs would impose. Neither opportunity nor impact cost (as defined here) may be included in determining whether a price is predatory.

The standard by which properly includable costs should be tested in order to determine whether a plaintiff has made a *prima facie* showing of predatory conduct is also in dispute. TCC suggests that prices should be measured by comparison with total costs (fixed plus variable), while IBM champions the use of only variable costs for this purpose. TCC also advances an alternative test that is to be used when barriers to entry into the industry are high: pricing below the profit maximization level. This alternative test will be addressed first.

A manufacturer with monopoly power would, in the absence of a predatory animus, be expected to cease producing additional units at the point where the additional costs it would incur would exceed the additional revenue it would expect to result. The highest price which it could charge for that output without dissuading customers from buying would more than cover the extra costs the manufacturer incurred for producing that last item. (In economic terms this means that the demand curve, at the point where the marginal cost and marginal revenue curves intersect is higher than either. See Areeda and Turner, "Predatory Pricing and Related Practices Under Section 2 of the Sherman Act," 88 Harv. L. Rev. 697, 697-703 (1975) (hereinafter, Areeda and Turner), for an explanation of these concepts.) If production is profitable at that point, that highest price will also more than cover the manufacturer's total costs. (The average cost curve will also be lower than the demand curve.) By charging that highest price that customers will pay for that quantity of output, the manufacturer with

monopoly power would be profit maximizing. If it were to charge something less, but still cover its total costs and make a profit, it is not acting rationally, and presumably is acting to exclude competition.

But a manufacturer with market power which, while still making some profit fails to keep prices as high as it could without losing customers, is not engaged in predatory pricing. The notion that a failure to profit maximize could violate the Sherman Act was soundly rejected by Professors Areeda and Turner who point out that not only would such a standard be unmanageable, but as long as the manufacturer is making some profit only less efficient rivals are eliminated or excluded from competition [Areeda and Turner, *supra*, at 704-709].

The profit maximizing test originated in self-contradictory* dicta [*International Air Ind., Inc.* v. *American Excelsior Co.*, 517 F.2d 714, 724-25 (5th Cir. 1975)] and has been perpetuated in dicta [*Hanson* v. *Shell Oil Co.*, 541 F.2d 1352, 1358 n.5 (9th Cir. 1976)]. It will not be perpetuated here. The imposition of such a standard would be unmanageable, preclude a firm with monopoly power from competing on the merits, and harm consumers. It is rejected as a matter of law.

Because it does not appear that TCC, without the consideration of opportunity costs, without the consideration of impact costs, and without the adoption of a profit maximization test, could prove predatory pricing by either the total cost test or the variable cost test, it is not necessary to determine at this time which of those latter two tests would be appropriate here.

Defendant's summary judgment motion on pricing and FTP is granted, and plaintiff is given leave to resubmit its pricing and FTP claims within ten days from the date of this order if it can meet the standards set forth herein.

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* At one point in the cited text the Court seems to equate the term profit maximization with pricing at average variable cost, while later in the same paragraph it sets out those two standards as alternative tests.

ON MOTION TO STRIKE

Defendant IBM moves to strike and preclude evidence on ten of the acts which plaintiff TCC has designated as conduct by which IBM acquired and maintained and attempted to acquire and maintain monopoly power in violation of Sections 1 and 2 of the Sherman Act [15 U.S.C. §§ 1 and 2]. Many of the acts in question occurred prior to TCC's entry into the computer field in 1968. In general, IBM maintains that these acts are irrelevant to any damage claim advanced by TCC and that allowing them to be introduced into evidence would only serve to prejudice the jury and waste time. TCC's position is that a monopolist's conduct must be viewed as a whole, that the acts under attack clarify the character of damage related acts, and that they are evidence of the specific intent to monopolize which is material to TCC's attempted monopolization claim.

In 1962, the United States Supreme Court faced a similar problem. The plaintiff in *Continental Ore Co.* v. *Union Carbide & Carbon Corp.*, 370 U.S. 690 (1962) [hereinafter, *Continental Ore*] sought to introduce evidence of acts of conspiracy and monopolization which began in 1933, prior to its entry into the relevant market in 1938. The Court held that the exclusion of that evidence was improper since it was "clearly material to petitioners' charge that there was a conspiracy and monopolization in existence when they came into the industry, and that they were eliminated in furtherance thereof" [370 U.S. at 710]. IBM attempts to distinguish this case as one which also involved a conspiracy charge, an element not present here. But the conspiracy was not crucial to the Court's evidentiary ruling; evidence of acts prior to plaintiff's market entry is admissible to show monopolistic intent [see 370 U.S. at 710 n.15].

With that background, the acts complained of will be examined individually to determine their admissibility.

(1) TCC alleges that the System 360 was prematurely announced in 1964 in order to prevent competitors from securing firm commitments for their machines. Since TCC has alleged monopolization of the general purpose electronic digital computer systems market, and since this act occurred within the

five-year time frame approved in *Continental Ore*, it is relevant and not too remote. The motion to strike this act and preclude evidence thereon is denied.

(2) TCC alleges that the scientific computers, System 360 Models 44 and 90, and IBM's time-sharing computer, System 360 Model 67, were prematurely announced and intentionally priced below cost. These models were announced in 1964 (Model 90) and 1965 (Models 44 and 67). As with the System 360 announcements, these acts did not occur so far in advance of TCC's entry into the field that their probative value is insignificant, and here the relevancy is heightened by the allegation of predatory pricing. The motion to strike this act and preclude evidence thereon is denied.

(3) TCC alleges that the 1956 settlement agreement, which terminated antitrust litigation involving Sperry-Rand and IBM and resulted in those two companies sharing their technical know-how, restrained trade. This act occurred eleven years prior to the formation of TCC and is thus "too remote to have sufficient probative value to justify burdening the record with it" [*Continental Ore*, 370 U.S. at 710]. The motion to strike this act and preclude evidence thereon is granted.

(4) TCC alleges that IBM's severe reduction of purchase price discounts on used computers in 1965 was done to destroy the competition that IBM faced in the leasing of computers. This evidence is not too remote. It is relevant not only as evidence of conduct by which monopoly power was acquired and maintained, but also as evidence of the specific intent with which IBM acted, and may serve to overcome any defense that monopoly power was "thrust upon" the defendant as a result solely of its superior skill, industry, and foresight. The motion to strike this act and preclude evidence thereon is denied.

(5) TCC intends to adduce evidence of IBM's 1966 reduction of purchase prices by 3% and concomitant increase in rental rates by 3%. It is not clear how this is relevant to TCC's charge that it was IBM's plan to exclude leasing company competition since this action would lower the "multiplier" while

elsewhere TCC complains that high multipliers damaged the lessors [see (8) below]. Still, this act occurred in the same general time period as other acts complained of, and if TCC wishes to prove it in order to paint the "whole picture" they may do so [see *Case-Swayne Co.* v. *Sunkist Growers, Inc.*, 369 F. 2d 449, 459 (9th Cir. 1966)]. The motion to strike this act and preclude evidence thereon is denied.

(6) TCC alleges that IBM changed the plan by which IBM salespersons were compensated in order to encourage them to promote leasing rather than sales. This too is relevant to the "whole picture" of what TCC maintains was an IBM attempt to destroy leasing competition; it is not too remote, and also may be helpful in interpreting the intent that accompanied other acts complained of. The motion to strike this act and preclude evidence thereon is denied.

(7) TCC alleges that IBM tampered with leasing company financing. IBM counters that these allegations are not germane to TCC since TCC was not dependent upon the public securities market or bank credit, but was internally financed. If, as alleged, IBM discredited the leasing companies' image then that discreditation might tarnish their standing in the eyes of potential lessees as well as in the money market, and so affect TCC. Additionally, this evidence bears upon intent and may show that monopoly power was not thrust upon defendant. The motion to strike this act and preclude evidence thereon is denied.

(8) TCC alleges that IBM set the multipliers (the ratio of purchase price to monthly rental rate) on System 360 Models 25 and 85 (in 1968 and 1969) and on System 370 (in 1970) exceedingly high in order to harm leasing companies, and priced Models 25 and 85 below cost. IBM feels that these issues are irrelevant because TCC ceased purchasing IBM mainframe equipment prior to these actions. But TCC claims that IBM monopolized the general purpose systems market and claims damage to its business as a result. These acts are certainly relevant to a claim of monopolization in that market and thus, the motion to strike these acts and preclude evidence thereon is denied.

(9) TCC alleges that during the 1970's IBM withheld interface information which other manufacturers needed to compete in the IBM plug compatible peripherals market. As a lessor of equipment produced by those other manufacturers, TCC's fortunes were intertwined with those of its suppliers, and since TCC has also alleged monopolization and attempted monopolization of the peripherals markets, these acts are clearly relevant to its case. The motion to strike these acts and preclude evidence thereon is denied.

APPENDIX D

IN THE

United States District Court

FOR THE NORTHERN DISTRICT OF CALIFORNIA

In re IBM Peripheral EDP Devices Antitrust Litigation
MDL No. 163-RM

TRANSAMERICA COMPUTER COMPANY, INC., a corporation,
Plaintiff,

v.

INTERNATIONAL BUSINESS MACHINES CORPORATION, a corporation,
Defendant.

C-73-1832 RHS

ORDER

November 14, 1978

SCHNACKE, District Judge:

On October 3, 1978, this Court issued an Order which: (1) rejected the inclusion of opportunity and impact costs in a determination of whether defendant's prices were below-cost and predatory; (2) ruled that a profit-maximization test would be inappropriate in that determination; and (3) because it appears plaintiff could not show predatory pricing without inclusion of the impermissible costs or resort to the profit-maximization test, granted defendant's summary judgment on pricing and FTP. Plaintiff, within the ten days it was allotted to do so, resubmitted its pricing case asking that impact costs be reconsidered and that clarification be provided as to whether impact cost, opportunity cost, and FTP evidence may be presented as reflective of defendant's intent.

The motion to reconsider is denied. By way of "clarification" it is sufficient to say that the October 3 Order was not a ruling upon the admissibility of any evidence of intent.

Defendant has responded to the pricing resubmission by renewing its motion for summary judgment on pricing and FTP, and by moving for summary judgment on plaintiff's damage claims. Both of defendant's summary judgment motions are denied.

APPENDIX E

IN THE

United States Court of Appeals

FOR THE NINTH CIRCUIT

TRANSAMERICA COMPUTER COMPANY, INC., a corporation, *Appellant,* v. INTERNATIONAL BUSINESS MACHINES CORPORATION, a corporation, *Appellee.*	No. 80-4048 ORDER May 2, 1983

Before: PREGERSON and CANBY, Circuit Judges, and LUCAS,* District Judge.

The panel has voted to deny the petition for rehearing. Judges Pregerson and Canby voted to reject the suggestion for rehearing en banc and Judge Lucas recommended such rejection.

The full court has been advised of the en banc suggestion and no judge of the court has requested a vote on it.

The petition for rehearing is denied and the suggestion for rehearing en banc is rejected.

* The Honorable Malcolm Lucas, United States District Judge for the Central District of California, sitting by designation.